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## CONTENTS

	PAGE
Editorial Notes .. .. .	1
Higher Railway Charges Hearing .. .. .	3
Sir Montague Eddy .. .. .	3
Western Region Telecommunications .. .. .	4
Rolling Stock Utilisation in Iron and Steel Works .. .. .	4
Letters to the Editor .. .. .	6
The Scrap Heap .. .. .	8
Overseas Railway Affairs .. .. .	9
Determining Working Loads and Stresses .. .. .	11
Pacific Locomotives for Jodhpur Railway, India .. .. .	16
Hydraulic Feed Boring Machine .. .. .	18
Fabric Cushioning for Bridge Bearings .. .. .	19
Provincial Station Architecture in Italy .. .. .	20
Personal .. .. .	23
News Articles .. .. .	26
Notes and News .. .. .	30
Railway Stock Market and Table .. .. .	32

## DIESEL RAILWAY TRACTION

The January issue of this RAILWAY GAZETTE publication illustrating and describing developments in Diesel Railway Traction, is now ready, price 2s.

## The Outlook for 1950

THE year which has just opened will be the third of British nationalised transport. Since primarily the railways were brought under State control on January 1, 1948, efforts have been made by the various Executives set up by the British Transport Commission to take the initial steps towards the fulfilment of the general duties of the Commission as laid down in the Transport Act, 1947. This is to provide an efficient, adequate, economical and properly integrated system of public inland transport for passengers and goods. The progress which has been made in this direction may have disappointed some of the keenest advocates of nationalisation as a panacea for all the ills of transport. Those with a wider appreciation of the inherent difficulties of welding together so vast and diverse a system will not have been surprised at the relative slowness of the progress which has been made. In

the current year the difficulties which have faced the railways in particular, and transport in general, since the end of the war, and which in most cases have arisen from causes quite outside the control of the transport authorities, are not likely to be much diminished. The decision of the Government to impose economies in capital expenditure, and to interpret capital in this connection, rather widely, will make the task facing the Railway Executive more onerous than it need have been. There is still a very heavy backlog of works to be undertaken on the railways to enable the best operating use to be made of their assets. The many schemes deferred by the war and the impossibility of maintaining renewals during and since hostilities have resulted in a great mass of urgently needed measures which will be undertaken less rapidly because of the recently announced Government economy policy. Nevertheless, Sir Eustace Missenden, the Chairman of the Railway Executive, sounded the right note in his New Year message to the staff when he said: "Now is the time when we must prove that the spirit which prevails is the spirit of service and progress." He emphasised that the problems which confronted the railways in the end came back to the individual, and that the sum total of the railways' efforts was profoundly affected by what each one of the staff did or failed to do.

## The New Year Honours

COMPARATIVELY few awards of direct transport interest figure in the New Year List, but honours are bestowed on several persons who were formerly connected with the railway industry, or have temporarily relinquished direct association with it. The new Barons include Sir Steven Bilsland (for public services in Scotland), sometime a member of the L.M.S.R. Scottish Committee; Mr. T. W. Burden, M.P., a former member of the National Executive of the Railway Clerks' Association; and Mr. Joseph Henderson, M.P., who was President of the National Union of Railwaymen from 1933 to 1936. Field-Marshal Sir William Slim, who, until his appointment as Chief of the Imperial General Staff, was Deputy-Chairman of the Railway Executive, is made a G.C.B. The new Barons include also Mr. John Wilmot, M.P., former Minister of Supply, who was responsible for the first draft of the Iron & Steel Bill, and those who receive knighthoods include Mr. H. V. Tewson, General Secretary of the Trades Union Congress. Mr. D. M. Sinclair, General Manager, Birmingham & Midland Motor Omnibus Co. Ltd., is made a C.B.E., and recipients of the O.B.E. include Mr. F. J. Chapple, Director & General Manager, Bristol Tramways & Carriage Co. Ltd., and Mr. F. Weller, Chief Officer (Administration), Commercial Department, Railway Executive.

## Message to N.U.R. Members

MR. J. B. FIGGINS, General Secretary, N.U.R., in an article in *The Railway Review* for December 30, 1949, outlines the activities of the N.U.R. during the past year, and recalls that, although the main objective of securing a substantial flat-rate increase for all grades had not been achieved, important concessions were obtained in the face of adverse factors, including opposition from other railway unions. The biggest task facing the N.U.R. industrially in 1950 would be its endeavour to obtain an increase for the lower-paid grades. With the advent of devaluation this became ever more urgent for the reason that there must inevitably take place an increase in the cost of living. Mr. Figgins then recalled his New Year message for 1949, when he stressed among other matters the need for speeding up the integration of rail and road transport and the submission of the new charges scheme, and expressed the view that, although the Minister of Transport has had to extend the period for another two years, "every effort should be made to have this work completed long before the two years expire so that we may be able to get nationalised transport on a thoroughly established basis."

### New N.U.R. Wage Claim

**I**N last week's issue it was predicted that the National Union of Railwaymen would dissent from the T.U.C. post-devaluation wage policy set out in the report which is to be discussed by T.U.C. executives on January 12. The N.U.R. not only disagrees with temporary wages restraint, but, as is reported on page 28, now has decided to press its claim for a £5 a week minimum wage for its members, involving increases of up to 7s. 6d. a week for many railwaymen. Devaluation is a major event affecting the economic situation since the N.U.R. in September accepted the rejection by the Board of Conciliation of its claim for a 10s. a week increase for its members. It is noteworthy that the A.S.L.E.F. and the R.C.A. have refused to support the new N.U.R. claim.

### Continued Rise in Wage Rates

**T**HE latest figures issued by the Ministry of Labour show that wage increases in the first eleven months of last year have added £978,100 to the weekly aggregate of wages. More than 5,000,000 workers have benefited by these increases. During the corresponding months of 1948 there was a net increase of £1,864,400 in the weekly full-time wages of 7,611,500 workers. Of the total additions to wages, something like £31,000 resulted from changes in wage rates in November, affecting the weekly full-time wages of 270,000 workers. Of the total increase of £31,000, about £16,000 resulted from direct negotiations between employers and workers, £8,000 was the result of arrangements made by Joint Industrial Councils or other joint standing bodies established by voluntary agreement, about £4,500 resulted from the operation of sliding scales based on the index of retail prices, £1,500 resulted from arbitration awards, and the remainder resulted from Orders made under the Wages Councils Acts. An examination of the monthly statistics shows that the index of weekly rates of wages, with June, 1947, taken as 100, was the same at 109.

### Overseas Railway Traffic

**F**OLLOWING a £400,000 decrease in the previous month, Canadian Pacific Railway gross earnings for November were down by £655,000 and though there was an accompanying fall in working expenses, net earnings were £179,000 lower, at £1,505,000. C.P.R. gross earnings amounted to £10,723,000 and working expenses at £9,218,000 compared with £9,694,000 for the same month 1948. A £374,000 increase in Canadian National Railways operating expenses for November, together with a £84,000 decline in operating revenues, reduced net revenue by £458,000. Operating revenues were £14,853,000 and after taking into account operating expenses at £13,022,000, net revenue was £1,831,000. One month before the close of the financial year there has been a total advance in both C.N.R. and C.P.R. gross earnings and net earnings of the C.P.R. are £327,000 higher, at £5,839,000, though they are down by £1,127,000, at £5,648,000, in the case of the C.N.R.

### The Canadian Railways in 1949

**T**HE latest of the customary annual reviews of the activities of the past year by the presidents of the Canadian Pacific Railway and Canadian National Railways are summarised elsewhere in this issue. Both companies report heavy traffic, and the C.N.R. revenue, at \$499,000,000, establishes a record, though operating expenses, inadequate rates, and fixed charges combine to nullify the traffic results, so that, as the C.P.R. president states, "the ratio of net earnings to gross earnings remains at the lowest level in the company's history." Strict economy in operation has to be the watchword; nevertheless, important modernisation schemes, including motive power and rolling stock equipment, are in hand. The C.N.R. is saddled with the burden of the debts of predecessor companies, and the C.P.R. is burdened by the still too low rates which it is empowered to charge. It is

to be hoped that the briefs which both companies have submitted to the Royal Commission on Transportation now sitting in Canada will result in their being permitted to provide their efficient, low-cost transport, at rates more compatible with the service given, as part of wider recognition that the railways are indispensable to a country whose great potentialities match its vast distances.

### National Bus Organisation in Scotland

**N**OW that complete ownership is vested in the B.T.C., the Scottish group of bus companies is taking various steps to simplify its organisation, based, of course, on that of the Scottish Motor Traction Co. Ltd. The Caledonian Omnibus Co. Ltd., which was transferred from the Tilling Group to the S.M.T. Group last May, is now being merged into the Western S.M.T. Co. Ltd., with the exception of a few services from Edinburgh that are passing to the S.M.T. itself. The Western S.M.T. is also taking over the activities of its subsidiaries, the Greenock Motor Services Co. Ltd., the Rothesay Tramways Co. Ltd., and W. & R. Dunlop Limited. The Dundee area of the S.M.T. is being transferred to W. Alexander & Sons Limited, and Central S.M.T. Co. Ltd. is absorbing its subsidiary, the Lanarkshire Traction Co. Ltd. Presumably, Alexander will also take over David Lawson Limited, and so leave the major portion of Scotland divided between the four area companies of the S.M.T. Group, so far as concerns bus services already nationalised. The position immediately before the present changes was shown in a full page map which we published on page 679 of our issue of June 17, 1949. This rearrangement of the B.T.C.-controlled bus operators in Scotland is a logical development, but it is not an area scheme under the Transport Act, 1947. For some years B.E.T. has held no bus interests in Scotland.

### British Road Services

**T**HE British Transport Commission proceeded initially on a policy of voluntary acquisition of road transport freight operators, designed to secure control of sufficient existing undertakings to provide the nucleus of its own organisation. Large selected undertakings were appointed as primary (or holding) companies, and these absorbed the shares of the smaller concerns. Businesses acquired compulsorily also were placed under the operational control of the primary companies. This was only an interim arrangement, and the Road Haulage Executive introduced its own divisional organisation, consisting of eight divisions, divided into districts, and the company structure has now largely disappeared. The remaining specialised traffic companies were taken into the R.H.E. organisation on January 1. The companies merged include the Pickfords and Hay's Wharf Cartage Group, the trading names of which will continue to be used in association with the Executive's general trading title of British Road Services.

### Indian Metre-Gauge Pacific Locomotives

**A** SERIES of ten Pacific locomotives built by the Baldwin Locomotive Works, U.S.A., has been put into service on the metre-gauge Jodhpur Railway of India. These locomotives, which have been built to Jodhpur Railway specifications, have a maximum axle-load of 10 tons 10 cwt. on the driving axles and 11 tons 10 cwt. on the carrying axles. A working pressure of 200 lb. per sq. in. is carried by the boiler, which has a dia. of 5 ft. at the smokebox end; there are 21 flue tubes of 5½ in. dia. and 84 boiler tubes 2 in. dia. and 15 ft. 6 in. long. The firebox has been designed to burn grade 11 Indian coal with a calorific value of 6,000 and a 25 per cent. maximum ash content. Tubes and flues make up 1,151 sq. ft. of the total heating surfaces, together with 112 sq. ft. from the firebox and 25 sq. ft. contributed by the combustion chamber. Tractive effort at 77 per cent. m.e.p. is 18,820 lb. and ratio of adhesion is 3.75; an illustrated article on the locomotives appears elsewhere in this issue.

## Higher Railway Charges Hearing

ON Wednesday of this week the Transport Tribunal commenced its public hearing of the application by the British Transport Commission for an increase in railway freight and dock charges. The Transport Tribunal is sitting as a Consultative Committee as required under the procedure laid down in the Transport Act, 1947. Details of the increases which it is proposed should be made were given in our December 2 issue. The importance which is attached to the outcome of the application has been shown by the number of bodies represented. In addition to the Traders' Co-ordinating Committee on Transport, which represents 60 organisations, including the Federation of British Industries, the Iron & Steel Federation, the National Farmers' Union, the Association of British Chambers of Commerce, and the National Union of Manufacturers, many other important bodies of private traders, and three State corporations, the National Coal Board, the Gas Council, and the British Electricity Authority, are appearing in opposition to the application.

It is abundantly evident from the opposition which has been marshalled against the proposed increases that the Transport Tribunal was wise to decide on a public hearing of evidence. If the original suggestion had been adopted of taking note of representations by document, there can be no doubt that there would have been grave public disquiet, and that it would have been difficult to have carried conviction with trade and industry or the public that the higher rates were justified, except as an emergency measure to meet a loss, the realisation of which would have been ascribed according to the political convictions of the assessor. During the present hearing there can be no doubt that the Tribunal, before advising the Minister of Transport of its judgment on the application, will take all necessary steps to satisfy itself that the railways are being efficiently and economically managed. The various parties opposing the application will have a full opportunity of airing their views and bringing forward any points which bear on this matter. In the result, on the assumption that the Commission succeeds in its application, it and the Railway Executive will be supported by the certificate of the Transport Tribunal.

As this week's issue was going to press the Tribunal hearing was in its opening stages, and for that reason we are deferring a report of the proceedings until next week's issue. Some difficulties which did not apply in the old Railway Rates Tribunal hearings are unavoidable at the present time. The new form of accounts, and changes in accounting practice, which have been brought into effect by the British Transport Commission, make impossible direct comparisons of financial results of railway working for 1948 as compared with pre-nationalisation periods. It has already been stated that during 1948 railway costs have increased to about 120 per cent. over the pre-war level. On the other hand, some part of this advance from a net revenue point of view has been relieved by the elimination of some £13 million in the interest charges which the old companies had to bear, and by about £8½ million in the amount now set aside for depreciation. It is not known what additional economies may have been effected by other changes in accounting practice.

There is no doubt also that many economies have been made on the railways themselves. The report of the British Transport Commission gave some indication of the scope of these. A saving of at least £1,000,000 a year, it stated, was to be effected by eliminating surplus wagons. Staff was put at some 26,000 in excess of requirements, and a reduction by this amount was to be aimed at within a period of three months. A curtailment of staff on this scale, assuming an average earning of £5 a week, would offset the increases in pay and improved conditions of service which took place during 1948, and which were put at £6,300,000.

The Commission already has made it plain that the present application is by way of an emergency measure, and is independent of its future charges policy. Both the Railway Executive and the British Transport Commission would be among the first to admit that increasing charges

is no real solution to the present problem. That can be found only in the attraction of more traffic to the railways. Higher rates are likely to make this approach even more difficult, but there is no doubt that the high level of railway charges has its root in the obligations and restrictions under which railways have to operate, and in the inequality of track costs as between the various forms of inland transport. The Commission has powers to deal with these problems, and to bring about a properly integrated system of transport. That will involve courageous handling of the road-rail problem. What rates will rule, either for road, or rail, or both, if and when a properly integrated transport system is evolved, cannot be foreseen, but railway rates may well be below the current level. The Commission's report also drew attention to the fact that in the case of the railways, an operating ratio of 92 per cent, coupled with a high proportion of non-variable charges, means that a small percentage decline in gross receipts can produce a disastrous effect on net receipts. Sir Cyril Hurcomb also emphasised this point recently. In 1948 railway gross receipts were £337,315,000. A variation either way of 1 per cent, therefore, makes a difference of well over £3,300,000.

## Sir Montague Eddy

THE death of Sir Montague Eddy, which we recorded briefly last week, removes one of the most distinguished personalities of recent years in Anglo-Argentine railway circles, and one, indeed, who was prominent in a wide sphere of activities in Argentina, where he was a popular figure. His own death follows closely on the passing, as such, of the British-owned railway systems in the Argentine, and the crowning achievement of his career was the leading part he played in the difficult negotiations connected with the acquisition of the railways by the Argentine Government.

Sir Montague Eddy came of a notable railway family, and, like his father, the late Mr. E. M. G. Eddy, and his brother, Mr. Alexander Eddy, started his career on the London & North Western Railway. His father afterwards became the first Commissioner of Railways for New South Wales, and Mr. Alexander Eddy retired in 1945 as Chief Legal Adviser & Solicitor to the London Midland & Scottish Railway. Montague Eddy himself left the L.N.W.R. for Argentina in 1915, when he was appointed Assistant General Manager of the Buenos Ayres Great Southern Railway, of which he became General Manager in 1919. He retired from that position in 1930, when he joined the boards of that company and of the Buenos Ayres Western Railway, of both of which he became Chairman in 1941. During his service in Argentina, in addition to his able administration of the largest individual railway system in South America, he took a prominent part in public life in general, and was for several years President of the British Society in the Argentine Republic. After his return to England he continued, by frequent visits, to keep in close touch with railway problems on the spot, and he also joined the boards, not only of several other British-owned lines in Argentina, but of the Bank of London & South America. During the recent war he did valuable work in connection with the organisation and supply of Red Cross parcels for British prisoners-of-war.

The end of the war brought many drastic changes, and among them was the conclusion of an era in British-Argentine commercial relations. As in other countries, Government ownership of business enterprises became a popular demand in Argentina, and it fell to Eddy to bear the brunt of the complex negotiations concerning the future of the railways. After having visited Argentina as a member of the financial mission led by Sir Wilfrid Eady in 1946, he returned later in the same year as head of the British delegation which negotiated the terms of acquisition of the railways by the Argentine Government. Since his return to England and up to the time of his death he had been concerned with trying to secure the full implementation of the agreement, particularly in respect of the treatment of the British staffs of the railways.



## Western Region Telecommunications

WHEN studying changes in railway organisation one is inclined to assume that an adequate system of communications exists between all concerned. Increasing demands are being made on telephone and telegraph circuits, however, and their ability to meet them depends on developments of quite recent years. Technical research is looking ahead to still more exacting requirements. Mr. C. A. Browne, a member of the staff of the Operating Superintendent, Paddington, Western Region, stated in a paper to the Western Region, London Lecture & Debating Society, on December 15, that in the future the provision of 600 communication channels over only four conductors was envisaged by the G.P.O. Line capacities of this order result from the adaptation of radar techniques, just as voice-frequency methods based on the use of thermionic valves in radio have enabled the simple telephone circuit to carry several conversations simultaneously. Mr. Browne said that the present maximum number of services operated on the Western Region over a single physical circuit was five, namely, one ordinary telephone link, three carried telephony channels, and a teleprinter channel.

In his review of railway telecommunications, Mr. Browne recalled the pioneer Great Western telegraph installation between Paddington and West Drayton in 1838, and the subsequent history of telegraph development in this country, which results today in the railways having certain obligations regarding the acceptance and delivery of public telegrams as well as privileges in respect of the free transmission of messages connected with their own business. Pole routes and wires used exclusively for railway purposes were retained by the G.W.R. under an agreement negotiated with the Postmaster-General in July, 1868, and form the structure on which the Western Region communications system is based.

Teleprinters have done much to eliminate delays at peak periods experienced with the old single-needle and sounder type telegraph instruments, enabling as many as 70 messages to be transmitted in an hour over one circuit at times of pressure. Also, duplex teleprinter working (simultaneous transmission of messages in both directions) requires only one operator at each end of the line instead of two. Pneumatic systems for delivery of messages from the teleprinter room to individual offices are in use at the larger Western Region centres. At Bristol, a "ring" circuit is used in place of radial tubes, with automatic control of messages circulating on a one-way traffic system, so that a message placed in the tube at any point is despatched as soon as there is a section clear to receive it.

The convenience of the telephone compared with telegraphic systems, except where a written record of messages is required, has led to an extensive system of telephone trunk lines being built up in the Western Region, linking railway exchanges at the principal centres. From these exchanges there are extensions to local offices and depots, lines to the Post Office telephone system, and omnibus circuits serving outlying stations, signal boxes, and depots. Points on the omnibus circuits can intercommunicate without the intervention of the exchange, but call the exchange operator for other facilities. Slides were shown of the railway exchange at Paddington Station, where there are 900 extension lines; 90 lines to the Post Office system; 35 railway trunk lines; 31 miscellaneous lines to other Regional headquarters, London depots, and so on; and ten omnibus circuits embracing 94 outlying stations and signal boxes. Sixteen tie lines connect Paddington to a satellite automatic exchange at Old Oak Common, itself having 150 extensions.

A separate and extensive traffic control telephone system exists in the Western Region, built up around five control trunk lines between the various offices. The local circuits radiating from the control offices are of a modified omnibus type, intercommunication between outstations not being provided. In most cases each outstation telephone has four ringing buttons, so that a call can be made direct to the desk of the traffic, relief, rolling stock, or engine controller as desired. An attempt is made to limit the number

of outstations on an omnibus circuit to 16, which are called in two groups by operation of one of a pair of call buttons for each circuit at the control office.

Mr. Browne concluded his lecture with some notes on future developments of Western Region communications. Among these are plans for new teleprinter switching stations to allow direct transmission and reception between machines separated by greater distances; and expansion of the railway trunk telephone system, with more channels between London and Bristol as an early stage of the programme. Among the sidelines of telecommunication activities, the author mentioned that 46 stations in the Western Region now have public address equipment. The paper paid a deserved tribute to the work of the telecommunications engineer whose influence today extends beyond his original domain into such matters as remote supervisory control of electric substations and relay interlocking signalling schemes.

## Rolling Stock Utilisation in Iron and Steel Works

TO meet the increasing traffic in iron and steel works that greater production has entailed, an improvement in the utilisation of locomotives and wagons within works areas has become necessary. In a paper on this subject, published in the December issue of the *Journal of the Iron & Steel Institute*, Mr. H. H. Mardon and Mr. M. D. Brisby describe the great amount of research undertaken with a view to establishing a method of traffic analysis which could be used to improve locomotive and wagon utilisation figures. The authors point out that the object of a works traffic system is to provide a service to the processing departments, which is satisfactory to the departmental manager only if it provides this service when it is needed. Correction of unsatisfactory locomotive and wagon user is not easy, since a solution can embrace many departments.

By force of circumstances, many works bear no resemblance to what they were when originally planned. Subsequent additions may have destroyed the suitability of a track layout, especially if sufficient thought had not been given to the possibility of expansion when the works was designed. Locomotive and wagon user is a recurring expenditure, and too much attention cannot be given to track layout when new works are contemplated. In a new undertaking, rail communications may represent only a small proportion of the expenditure in relation to the scheme as a whole, but their importance is quite disproportionate to their financial incidence.

With inefficient working, wagon demurrage can amount to a considerable expenditure during a year of working, representing so much money simply thrown away; neither can it be recovered. The solution is not to be found in increasing the number of wagons which may be owned by works, because, while this will lead to reducing demurrage charges, such a course will not convert an inefficiently operated works traffic system into an efficient one; in a large works where rail communication is considered necessary for internal distribution, sufficient works wagons should be available for this purpose. A comprehensive study of internal works services may result in the wider use of battery trucks or other mechanical handling devices.

Loading and unloading facilities also play a very important part in efficient operating; similarly, locomotive idle time can be kept within reasonable limits by utilising locomotives of suitable design with ample coal and water capacity and capable of working for long hours without having to return to sheds for servicing. Insufficient storage accommodation can also contribute to inefficient operating. The amount of stock held depends on the policy of the firm, as to whether stocks are closely regulated or otherwise; from a financial viewpoint, excess stock should be avoided. RecouPMENT could be based on a maximum and minimum consumption, correlating the consumption figures to the period it takes to obtain supplies at the works after the order has been placed. The paper includes a number of graphs which will be studied with interest, since they cover every aspect of traffic operating in works areas.



## Some Railway Centenaries of 1950

**P**ROBABLY the most outstanding railway characteristic of 1850 was the development of keen competition for long-distance traffic. In part, this was a result of the opening of substantial lengths of those lines which had been promoted during the period of the Railway Mania, and had survived the collapse. The desire to bring such works into use was accentuated by the impending Great Exhibition of 1851, in connection with which unprecedented traffics were expected. The actual mileage brought into use during the year was about 558 in Great Britain (and 60 in Ireland), compared with practically 700 (and 113) in 1849. Nevertheless, it included some very important sections, of which the longest was the 78½ miles of the Great Northern Railway from Maiden Lane temporary terminus at Kings Cross to Werrington Junction, on August 7.

Another important line, and almost as long, was the 74½ miles of the South Wales Railway from Chepstow to Swansea, on June 18. An important cross-country line was the Buckinghamshire Railway from Bletchley to Banbury and on to Oxford. In Scotland, the railway reached Aberdeen on April 1; and the Glasgow & South Western Railway came into existence in October, as an amalgamation, on the completion by its constituents of an alternative route between Glasgow and Carlisle via Nithsdale. Some of the principal openings of the year are recorded elsewhere in this issue in our "Scrap Heap" columns.

Railway policy was characterised by the determined efforts of the L.N.W.R. to maintain its position as the main trunk route to the North, and the opposition to the East Coast Route included subterfuges, secret agreements, and refusal of facilities. Pressure was brought to bear, so that G.N.R. locomotives were refused water supplies at Retford; trains were delayed so that connections were missed; and exchange of traffic facilities were refused at such points as Leeds and Wakefield. There was also a virulent campaign of rate cutting. For example, the Leeds-London fare was reduced by stages by the L.N.W.R. group from 15s. down to 5s. return, and the G.N.R. then announced that it would take passengers at 6d. less than any fare which its rivals might quote. In such circumstances (and with the Great Exhibition traffic looming) various temporary pooling agreements to reduce competition were made towards the end of the year.

During the year, the Britannia Tubular Bridge over the Menai Strait was completed, and Robert Stephenson, its creator, passed through "accompanied by about a thousand persons, drawn by three locomotives." It was opened for traffic on March 18. Two other Stephenson achievements were the completion of the High Level Bridge at Newcastle (opened for rail traffic in the previous year, however) and the Royal Border Bridge, carrying the North Eastern Railway across the Tweed at Berwick. The latter was opened by Queen Victoria on August 29. It was the last permanent link in the continuous line of East Coast railway between London and Edinburgh. In a speech at Newcastle, Stephenson observed:—

"It seems to me but as yesterday that I was engaged as an assistant in laying out the Stockton & Darlington Railway. Since then, the Liverpool & Manchester and a hundred other great works have sprung into existence. As I look back upon these stupendous undertakings, accomplished in so short a time, it seems as though we have realised in our generation the fabled powers of the magician's wand. Hills have been cut down and valleys filled up; and when these simple expedients have not sufficed, high and magnificent viaducts have been raised, and, if mountains stood in the way, tunnels of unexampled magnitude have pierced them through, bearing their triumphant attestation to the indomitable energy of the nation, and the unrivalled skill of our artisans."

George Hudson, the erstwhile "Railway King," was sliding ever more steeply down the slope of lost reputations. The pages of *Punch* for 1850 contained many "acks" about him, and his prestige reached its nadir when

his wax figure at Madame Tussaud's was removed and melted down.

A subject of debate during the year was the question of Sunday travel, and, at a meeting of the shareholders of the Caledonian Railway, an attempt was made to stop all Sunday travelling on that line. George Frederic Watts offered to decorate the great hall at Euston with monumental paintings, if the company would pay for scaffolding and colours, but the artist's offer was declined.

Dionysius Lardner's *Railway Economy* was published. It was the first detailed analysis of railway statistics, and constituted an original investigation of railway management, based on the limited statistical information then available. Paxton's famous design of the building of glass and iron to house the Great Exhibition took shape suddenly and dramatically. On June 18, 1850, he was at Derby, in his capacity as Chairman of the Works & Ways Committee of the Midland Railway, to try a pointsman. While evidence was being tendered, Paxton appeared to be taking copious notes. Instead he was designing the Crystal Palace!

Those who died in 1850 included Edouard Constant Biot, a famous French railway engineer; John Gibb, who built railway viaducts in Scotland; and John Howard Kyan, whose "kyanising" process for preserving wood seemed for a time to be of great value in the treatment of railway sleepers. Robert Stephenson, grandfather of Robert Louis Stephenson, died on July 12, 1850. This elder Stephenson was famous as a lighthouse builder and civil engineer. He was asked to report on a scheme of 1817 called the Edinburgh Railway, and examined various forms of rail. George Stephenson acknowledged that he adopted malleable iron rails as a result of Stephenson's remarks.

The births of 1850 include a number of notabilities whose activities in railway administration fall within living memory. Among them were Lord Aberconway, Chairman of the Metropolitan Railway; Lord Banbury, Chairman of the Great Northern; Lord Faringdon, Chairman of the Great Central, and Deputy Chairman of the L.N.E.R.; Sir George Stegmann Gibb, Solicitor, General Manager, and afterwards a Director of the N.E.R., and Managing Director of the Metropolitan District Railway, and of the allied Underground Electric Railways of London; Henry Edwards Huntington, first Vice-President of the Southern Pacific Railway (U.S.A.); Lord Anslow, Chairman of the North Staffordshire Railway; Sir William Wyndham Portal, Director and Deputy Chairman of the L.S.W.R.; Sir Alfred Waldron Smithers, the last Deputy Chairman of the S.E.R.; Nathaniel Spens, Director of the London, Chatham & Dover, and a Member of the South-Eastern & Chatham Managing Committee (and active throughout his career in the management and finance of railway enterprise); and Robert Millar, General Manager of the Caledonian Railway Company, and a Member of the Army Railway Council. Earl Kitchener of Khartoum, who did such a great deal to advance the completion of the Wadi Halfa - Khartoum Railway, was born on June 24, 1850.

Sir William Mitchell Acworth, the railway economist, was born on November 22, 1850. He was the author of *The Railways of England, The Railways of Scotland, The Railways and the Traders, The Elements of Railway Economics and A Historical Sketch of State Railway Ownership*. He served on the Royal Commission on Accidents to Railway Servants in 1899, on the Viceregal Commission on Irish Railways in 1906, and on the Board of Trade Committee on Railway Accounts & Statistics in the same year. He also served on commissions and committees concerning railways in Canada, Southern Rhodesia, and India, and was commissioned by the Council of the League of Nations in 1923 to conduct an investigation of Austrian railways. He performed a similar function regarding German railways on behalf of the Reparations Commission in the next year. Another noteworthy railway author born in 1850 was Alfred Rosling Bennett. Vice-President of the Institution of Locomotive Engineers, and author of *Historic Locomotives* and *The First Railway in London*.

## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### A Remarkable Journey by the "South Yorkshireman"

December 11

SIR.—Your correspondent in your issue of December 9 is misinformed. There is now no Tavern car on the "Master Cutler." It was removed some six weeks ago, after five months' hard fight by passengers with the Railway Executive.

Yours faithfully,

V. BOYD-CARPENTER

Highland House, Worksoy.

[The removal of the Tavern car formed the subject of a news paragraph in our December 16 issue.—ED., R.G.]

### London and South Wales and Bristol Services

December 17

SIR.—With reference to the editorial article in your issue dated December 9, on the commercial train services between London and South Wales and Bristol, I should like to point out that the 7.55 p.m. London to Swansea, with a slip service to Bristol, was restored in the summer timetable of 1946.

This train ran until March, 1947, when, because of the fuel crisis, it was taken out of service. Since then it has not been restored. I believe that when this train ran in 1946, the steamer service from Fishguard to Rosslare had not been restored, and the train was therefore run to Swansea only.

With the resumption of the steamer service to Rosslare it was necessary to restore the Irish boat train, but due to slower running schedules the train now leaves London at 6.55 p.m. instead of 7.55 p.m. Unfortunately, by this Bristol has lost a connection, which means that the service from London last thing at night is the same as it was during the war. I am hoping that with the coming summer timetable for 1950 this connection will be restored.

Yours faithfully,

P. A. LACEY

44, Nevil Road, Bristol 7.

### Swansea Valley Services

December 29

SIR.—Your correspondent Mr. J. F. Burrell, writing in the November 11, 1949, issue, makes a suggestion that I had thought of putting forward to the authorities, the combination of the Swansea St. Thomas-Brynamman (ex. L.M.S.R.) and Brynamman-Pantyllynnon (ex. G.W.R.) services, with the abolition of one of the two Brynamman stations.

Now that all lines around Swansea are under one management, the time is ripe for a further reorganisation of lines and services on the pattern of that carried out before the war by the G.W.R. in the Briton Ferry-Neath-Swansea area. I suggest that the Swansea Victoria-Pontardulais trains be extended to Pantyllynnon and Brynamman, returning *via* Ystalyfera to St. Thomas, thus enabling one train to do the work of three or four. By a simple connection north of Morriston, these trains could run instead *via* Landore Low Level into the centrally-sited High Street terminus, except those used by dock workers, for whom St. Thomas is more convenient.

I understand that the future of the former L.N.W.R. line running into Swansea Victoria has been debated by Swansea Corporation. Victoria is convenient only for the electric cars to Mumbles, and diversion of its traffic to High Street would enable connections to be given from the Cardiff-Carmarthen line to the Central Wales line, and allow the foreshore of Swansea Bay to be laid out as a promenade, with possibly a reservation for the Mumbles cars. It would necessitate a spur at Gowerton and the remodelling of the ex. G.W.R. station there. The chief difficulty, I visualise, apart from the possible need

of another bay at High Street for Central Wales trains, is that a few more trains than now would have to be worked over the steep banks east and west of Cockett, though all Central Wales trains not calling at Gorseinon might be routed from Pontardulais, *via* Morlais Junctions and over the Swansea avoiding line to a point just east of Llangyfelach Tunnel, thence over a spur to be built facing towards Morriston (G.W.R.), and so into High Street.

The St. Thomas-Brynamman trains could take a much larger share of the Swansea Valley traffic, now handled by crowded buses. Mr. Burrell mentions Gwaun-cae-Gurwen, which I know well, and its uncompleted direct line to the Swansea District lines, abandoned after three stations and some bridges and earthworks had been finished. Short of a boom in anthracite, this is unlikely to be completed. Mr. Burrell's idea of using the Gwaun-cae-Gurwen—Cwmlynnfell colliery line for passenger traffic, if the Coal Board agrees, is interesting, but a service this way to Swansea, or to Neath, by a new spur from Clydach (L.M.S.R.) to Felin Fran, appears to me too peripheral to tempt passengers from the direct, if over-full bus.

Yours faithfully,

B. G. WILSON

London, S.W.1.

### "The 'Flying' Scotsman"

December 8

SIR.—Curiosity, prompted by the letter headed "A Remarkable Railway Renaissance" in the issue of November 18, led me to examine the performance of Mr. R. Bell's "train of trains" over the East Coast main line south of York during the past 50 or so years.

In 1895, the "Flying Scotsman," leaving Kings Cross at 10 a.m. of course, was booked to arrive at York at 1.45 p.m.; by 1910 this had been improved by three minutes. This startling innovation had ended by 1927 when the train was running on the same times as in 1895. The golden years of thrust and energy really produced something. In 1936 the "Scotsman" reached York in 206 minutes. Not all of this had been secured in running time, for by now the Grantham stop, when applicable, occupied only two minutes, whereas it had hitherto oscillated around five or six. However, let us not damn the effort with faint praise.

In the up direction the story is this: 1895, depart York 2.45 p.m., arrive London 6.30 p.m.; 1910, depart York 2.32 p.m., arrive Kings Cross 6.15 p.m. By 1931 the train was leaving York two minutes earlier and reaching London at the same time. Corresponding to the acceleration in the down direction 1936 saw it leaving at 2.18 p.m., and arriving in London at 5.40 p.m.

What of 1949? In the course of half a century and more, albeit beset by two wars, technical development and operating skill enable the train now to perform the dazzling feat of passing York in the down direction at 1.52 p.m., *i.e.*, 7 min. later than it did in 1895, and to pass York on the up run at 2.33 p.m. and arrive at Kings Cross at 6.28 p.m.

To what can this monumental performance be attributed? Heavier trains? Poor coal? The reaction of the war on locomotive and permanent way? Or to the indolence of the staff? If any one or all these factors have played their part, then I will not carp unduly at the inability to restore the 1936 schedule, but to turn back the timetable pages to 1895 and to find that diminutive engines of that time, without the refinements of the present-day machine, could leave York 12 min. later than their 1949 counterparts and bring diminutive trains (by weight) to Kings Cross in 10 min. less time, or 2 min. later than the summer 1949 up "Scotsman" arrival time, suggests that we should summon the shades

of J. Proud, W. H. Hills, and Henry Ivatt to find out how it was done.

It is significant that those earlier performances were carried out without the aid of track-circuiting, automatic signalling, and elaborate and efficient telephone systems. When the developments that have taken place in the speeds and loads of aircraft, together with similar but smaller scale advances in road motor transport, are considered, the prospect before the railway is indeed dark. This gloomy view is not lightened when regard is paid to the level of fares and charges by the various means of transport. Unless, I submit, this "plateau" period in railway development comes to an early end, then it can only be with mounting misgiving that we face the future.

Whatever may be the technical limit to the speed of movement on rails, I am certain that we have not yet come within the practical reach of it; it is, therefore, distressing to think that what was evidently good enough for my grandfather is too good for me.

Yours faithfully,

GEO. F. THOMLINSON

56, Stockens Green, Knebworth.

### 1948 Locomotive Exchanges

December 29

SIR.—Mr. A. J. Maxwell's reference under the heading "1948 Locomotive Exchanges" in your issue of December 23 to the weaknesses of the Bulleid Pacifics, and to their use on three- or four-coach trains, is timely. I wonder whether some official attempt can be made to justify the vast array of these costly machines which by now must almost be causing congestion of the tracks (or the sheds?) of the Southern Region.

We know, of course, that on occasion the Pacifics can perform brilliantly if not economically, but how many really heavy jobs has the Southern Region, outside the capacity of the 4-6-0s which it still retains, and which are all most efficient engines, if properly maintained? And how often have the Pacifics to be piloted or assisted in getting their trains on the move? How many of them are at work at any one time?

The creation of the great Pacific armoured division for the non-electrified portion of the Southern Railway seemed incomprehensible enough. Its continued expansion by British Railways—not to mention the "Leader" class which is so tardy in reaching the stage of leading an ordinary train—looks very like sheer waste of public money, whether one regards the new recruits as operative units or as reserves against casualties.

Yours faithfully,

S. ELLINGWORTH

35, Knutsford Road, Wilmslow.

### Locomotive Lighting

December 19

SIR.—I was amazed to see that the excellent reproduction in your December 16 issue of the "mock-up" of a British Railways standard footplate for 1951 shows the gauges, etc., lit by oil lamps. If this really means that it is not intended to fit dynamos, I think it is a deplorable decision.

Point is given to this remark by the number of instances recently observed of locomotives hauling crack expresses with one of the headlamps blown out. On a recent occasion I even saw a Liverpool-London express (non-stop from Crewe) leave Crewe with only one headlamp alight. I had drawn the fireman's attention to this, but he seemed only mildly interested, and murmured something about the guard being about to give him the "right away," which actually he didn't for about 4 min. I spoke to one of the platform inspectors about this, suggesting that there seemed to be some slackness in this matter, and he told me that great difficulty is being experienced in keeping headlamps alight, and implied that train crews have almost given up the attempt.

In normal running conditions, the absence of one headlight is not likely to have any very serious result, but if only one is alight at the beginning of a long non-stop run, it may also be extinguished, and one can easily imagine circum-

stances in which the absence of headlamps alight could, if not cause, at least be a contributory cause of an accident.

Surely the long-term cure for this unsatisfactory state of affairs is provision of electric lighting on all main-line engines, which, apart from the safety aspect, would be an immense convenience to crews, as it has been where it has been provided. In the meantime it appears to be necessary to tighten up discipline and also to improve the design, and possibly also the maintenance of oil headlamps until these have been replaced by electric lighting. I hasten to add that I am *not* in any way connected with any firm supplying such equipment, either oil or electric!

In conclusion, may I point out that the equipment I am suggesting as standard for British Railways in 1951 was in use on some locomotives I saw in Turkey in 1929.

Yours faithfully,

W. G. POLACK

294, Hagley Road, Birmingham, 17.

### "British Railways for Boys"

December 31, 1949

SIR.—In your issue of December 30 you are good enough to review my recent book "British Railways for Boys," but your reviewer seems rather to have drawn on his imagination in saying that I was on the footplate of *Silver Link* when the "Silver Jubilee" passed Hitchin at 107 m.p.h., for no such claim appears in the book. This was the unforgettable trial trip of September 27, 1935, when the Running Superintendent alone accompanied the engine crew. I was certainly a passenger in the train, in which, from all that one has learned subsequently, the sensations were very considerably more exciting than any experienced on the engine! Personally, I cannot recollect having travelled on the footplate at any higher speed than 90 m.p.h., or slightly over.

Yours faithfully,

CECIL J. ALLEN

70, Rowlands Avenue, Hatch End.

### Wagon Turn-Round

December 19

SIR.—In your issue of December 16, "Traffic Apprentice" deals with Mr. E. R. B. Roberts's earlier letter, and raises the question how the coal merchant would fare with 50- or 70-ton trucks. The house coal trade is still largely in the hands of small men, who try to meet customers' personal preferences for a grade of coal from a particular colliery.

The National Coal Board also allots coal to a merchant on the basis of the number of his consumers, and in accordance with individual colliery output. If, for example, a merchant has a weekly allocation of 70 tons, he may well get this from four different collieries in six different grades, for which he must charge six different prices. Under the N.C.B. price structure there are over a dozen grades of house coal coming into this town, and the grading is done at the pit head as the coal is raised from the mine. One can only imagine the feelings of this unfortunate merchant if he were forced to take his weekly supply in one 70-tonner which would take a week or ten days to unload; and the howls of the customers all being supplied with "baker's nuts."

The present system provides for a fair distribution of the better class house coals with a quicker turn-round than could possibly be effected with very large wagons. One day we may have to receive our few hundredweights through a municipal coal depot capable of handling the traffic on the lines which Mr. Roberts so much advocates, but until then let us be thankful for the opportunity of paying for Ryder nuts or Cannock Chase cobbles from toy trucks. The mind reels at the prospect of bagging up the last few tons of grade "M" coal, which is on the soft side, from a truck which originally held 70.

Yours faithfully,

D. H. SHEWARD

3, Bouverie Avenue, Swindon.



## The Scrap Heap

### Some Railway Centenaries of 1950

March 18, Llanfair to Bangor opened (3½ miles). Chester & Holyhead Railway.

April 1, Portlethen to Aberdeen (Ferryhill) opened (7½ miles). Aberdeen Railway.

May 1, Bletchley to Banbury opened (31 miles). Buckinghamshire Railway.

May 1, Rugby to Market Harborough opened (17½ miles). London & North Western Railway.

May 13, Newport (Courtybella) to Blairstown opened (18½ miles) for goods. Passengers December 21. Monmouthshire Railway & Canal.

June 1, Market Harborough to Rockingham opened (9½ miles). London & North Western Railway.

June 18, Chepstow to Swansea opened (74½ miles). South Wales Railway.

June 21, Blackburn to Chatburn opened (12½ miles). Bolton, Blackburn, Clitheroe & West Yorkshire Railway.

June (?), St. Boswells to Kelso (temporary station) opened (10½ miles). North British Railway.

July 1, Huddersfield to Penistone opened (13½ miles). Lancashire & Yorkshire Railway.

July 15, Colwick (Midland) to Grantham opened (19½ miles). Ambergate, Nottingham, Boston & Eastern Junction Railway.

August 7, Maiden Lane (temporary London terminus) to Werrington Junction opened (78½ miles). Great Northern Railway.

August 28, Dunfermline to Alloa opened (13½ miles). Stirling & Dunfermline Railway.

August 29, Formal opening of Royal Border Bridge. (Goods traffic conveyed from July 20.) Replaced temporary viaduct opened October 10, 1848.

September 2, Oxford to Banbury opened (24½ miles). Great Western Railway.

September 12, Coventry to Nuneaton opened (10½ miles). London & North Western Railway.

September 26, Islington to Bow (junction with Blackwall Railway) opened (5

miles). East & West India Docks & Birmingham Junction Railway.

October 1, Verney Junction to Islip opened (10 miles); extended to Banbury Road, near Oxford (2½ miles). December 2, Buckinghamshire Railway.

October 5, Abbot's Wood Junction (Mid.) to Worcester opened (4 miles). Oxford, Worcester & Wolverhampton Railway.

October 7, Westbury to Frome opened (5½ miles). Great Western Railway.

October 21, Royston to Hitchin opened (13 miles). Royston & Hitchin Railway.

October 28, Closeburn to New Cumnock opened (25½ miles). Glasgow, Dumfries & Carlisle Railway.

November 1, Bootle to Foxfield opened (13 miles). Whitehaven & Furness Junction.

December 7, Islington to Camden Town opened (1½ miles). East & West India Docks & Birmingham Junction Railway.

December 18, Chester to Walton Junction opened (16½ miles). Birkenhead, Lancashire & Cheshire Junction Railway.

### Tomato Ketchup

The New York Central was ordered recently to pay a Quebec farmer \$111 in damages, with costs, for a tomato crop that never reached market because a freight train was parked too long.

There is nothing in the law limiting the time that a railway company may obstruct a level crossing on farm land—the statutory limit is 5 min. at any crossing on the public highway—but Mr. Justice Joseph Archambault held that the New York Central exceeded its rights by allowing a freight train to remain stationary for 4 hr. 15 min.

on the tracks running through a farm.

It was proved that because of this obstruction the farm workers were unable to convey a crop of tomatoes across the railway for delivery to the local canning company. The market was lost, and the farmer sued the New York Central for \$250, representing the value of the crop.

Plaintiff complained that obstruction by freight trains on the farm was a frequent occurrence.

### Timetable Heresy

A Yugoslav newspaper has reported that Soviet postal authorities had refused to deliver copies of the Yugoslav Railway timetable to Moscow. A consignment had been returned as "detrimental to Soviet politics and economy."—From the "News-Chronicle."

### "For Distinguished Services"

(Our New Year's Honours List)

Pope said that, since the world began, Man's inhumanity to man  
Makes thousands upon thousands mourn  
And wish they never had been born.

We know a quiet little man  
Who does his job, as best he can,  
And patiently pursues his way  
From dewy dawn to dying day.

He will not blazon history's page,  
Yet the whole world's his heritage:  
His patent of nobility  
Is plain for anyone to see.

Where others falter, he stands sure;  
His is the stuff that will endure.  
He greets misfortune with a smile,  
And trudges on that extra mile.

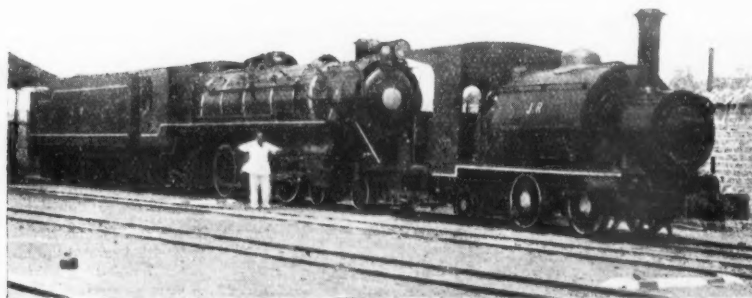
The lesser breeds can't make him moan;  
He'll cuss a bit, but never groan.  
Others may quote "the rights of man";  
He goes on "taking back the can!"

A. B.



*Reproduction of one of the many hand-painted posters that were displayed before Christmas at principal stations in the North Eastern Region of British Railways to advertise local rail facilities*

### Sixty Years of Motive Power on the Jodhpur Railway



*Dübs 0-4-2 tank engine built for the Jodhpur Railway in 1885, with Baldwin Pacific locomotive built in 1948, which is referred to in an illustrated article elsewhere in this issue*

## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### SOUTH AFRICA

#### Rolling Stock

For the past three months new wagons have been placed in service at the rate of almost a thousand a month. The September figure of 961 new wagons brings the total for this year to 5,392. Up to the end of September, 217 bogie and 666 four-wheel wagons had to be withdrawn from service. Four electric units and 67 steam locomotives have been placed in service this year, and 34 steam locomotives have been scrapped.

### EAST AFRICA

#### Meeting of Transport Advisory Council

The main subject of discussion at a meeting of the Transport Advisory Council held in Nairobi on December 9 was the effect on the East African Railways & Harbours of the changes in the Tanganyika groundnut scheme, announced in the House of Commons on November 23. The history of events since the issue of the first White Paper on the scheme in February, 1947, was related to the Council, and the measures taken by the Administration to reduce expenditure and to divert new rolling stock to the Central Line in Tanganyika and to the Kenya & Uganda Section were explained.

The Council recommended that the construction of the oil jetty at Mtwara should be cancelled and the remaining railway and port works should be completed at the lowest possible cost. It was further recommended that the Overseas Food Corporation should be asked to guarantee the full cost of working the railway and port. Until now the Corporation has undertaken to guarantee the interest and sinking fund charges on the capital cost, but in view of the reduced traffic expectations caused by the modification of the Corporation's production programme, it was considered desirable that the Corporation should extend the guarantee to cover the cost of operation.

The Council recommended that the 1950 draft estimates of revenue and expenditure for the East African Railways & Harbours services, as presented by the General Manager, should be submitted to the East African Central Legislative Assembly for approval. These estimates, which are framed on conservative lines, anticipate a total revenue in 1950 of £7,963,000 from railway sources and £1,945,550 from harbours. A sharp rise in expenditure is estimated for, which reflects increases in staff, increases in consumption of materials, fuel and oil supplies and increases in train mileages necessary to cope with the demands made by the increasing pace of development in the East African territories.

A proposal by the Government of Uganda that the East African Railways & Harbours Administration should perform work in connection with the storage of export products in Uganda, in particular cotton, was considered, and the opinion of the majority of the Council was that the Railway Administration should not undertake these additional responsibilities.

The expenditure of approximately £566,000 on new railway and port facilities was recommended, which included provision for additional quarters for Asian staff in Tanganyika, a depot for the hotel and catering services at Dar-es-Salaam, and a new station on the Jinja-Kampala section. Amongst the new port facilities for which provision was made, are a lighthouse at Mtwara; ten portal cranes, six of 5-ton and four of 7-ton capacity, for the deep-water quays at Dar-es-Salaam; and additional rail- and crane-served stacking grounds at Mombasa.

### VICTORIA

#### Electrification of Geelong Line

In evidence before the Parliamentary Public Works Committee, Mr. N. C. Harris, Chairman of Commissioners, recommended the proposed electrification of the line between Newport South and Geelong and duplication of the Newport South-Werribee and North Geelong-North Shore sections at an estimated cost of £1,188,000. The estimate for the electrification was £926,000, including locomotives, substations, and overhead equipment.

Having regard to prospective additional revenue, it was considered that the combined project of electrification and sectional duplication would give an estimated yearly saving of £52,000. After widening, it would be possible to schedule 18 passenger trains each way daily, instead of eleven before the war and seven today.

Mr. Harris said that the scheme would be quite consistent with an electric suburban service to Werribee.

#### Melbourne Suburban Developments

One of the post-war activities of the railways is the duplication of the suburban electric line to Heidelberg, which serves several expanding north-eastern suburbs. Trains to Heidelberg, eight miles from Melbourne, leave Princes Bridge Station, using the double track of the Reservoir and Thomastown line to Clifton Hill, whence a line nearly five miles long runs north-eastwards to Heidelberg. The line is single, except between Westgarth and Alphington.

A steady increase in traffic has taken place over the past 20 years. Plans made for doubling throughout were delayed by the war, but work has been begun, and considerable progress made. From June 19, 1949, double-line work-

ing has been in operation between Heidelberg and Ivanhoe, 1½ miles. Automatic signalling, with single lens "searchlight" signals, has replaced the former mechanical-electrical lever locking and track control over this section. Track construction is well advanced on the remainder of the route, and additional station buildings and platforms have been provided where necessary.

Doubling involves the widening of two viaducts, one crossing the Merri Creek at Clifton Hill, and the other the Darebin Creek, between Alphington and Darebin. Work has already been partially completed on the latter viaduct, where piers have been strengthened, but lack of girders is causing delay.

Late in 1948, Parliament passed a Bill for the constructing of a new suburban electric railway 4½ miles long, to leave the Heidelberg line at Alphington and to terminate at East Preston. The line will have six stations, two with goods sidings. There will be no level crossings. The branch will be single for 2½ miles of its length.

Two other suburban doublings are planned, one from Heyington to Glen Iris on the East Malvern line, and the other of the branch from Camberwell to Ashburton. The development of the Ashburton district, where a vast housing estate is more than half completed, has been much more rapid than was expected, and the line was recently extended from Ashburton to Alamein (see our issues of October 8, 1948, and April 22, 1949).

### ARGENTINA

#### Locomotive and Wagon Imports

The Argentine vessel *Rio Araza* recently arrived in the Port of Buenos Aires with a further eight diesel-electric locomotives for the General Belgrano Railway and the *Fletero* delivered the last 17 flat wagons of an order of 1,542 placed in Canada. These were built for war purposes and were destined for Russia, and their adaptation for the Argentine railways meant altering their gauge, braking equipment, and drawgear.

#### Summer Timetables

The summer timetables now in force contain a number of innovations. On the General Mitre Railway, the principal innovation is a weekly diesel car service called "El Gaucho," between Buenos Aires and Rio Cuarto (via Venado Tuerto, 383½ miles), Rio Cuarto (via Corral de Bustos, 435 miles), and Rio Tercero (428 miles). This service is operated by twin-unit Ganz diesel sets acquired before the war for Buenos Aires outer suburban services, and subsequently used between Buenos Aires and Pergamino (143 miles) and Buenos Aires and Venado Tuerto (233 miles).

The Tucumán service is maintained

by the air-conditioned "El Tucumano" twice weekly, the sleeping-car express "Estrella del Norte," also twice weekly, and a mixed train five days a week.

To Córdoba, the sleeping-car express "Rayo de Sol" and the day expresses "El Serrano" and "El Cordobés" run every day from Buenos Aires, as also the day express "El Serrano Rosarino" from Rosario. A new one-class day express called "El Criollo" runs three times a week.

Between Buenos Aires and Rosario, the daily express service consists of "El Porteno" (first class and second class), "El Popular" (one class only), and "El Rosarino" (first class only). An additional express each way, named "El Vespertino," runs on Saturdays.

An express one-class diesel service is maintained twice daily between Rosario and Santa Fé, connecting with the expresses to and from Buenos Aires; the sleeping-car express "El Santafecino" runs six times a week between Buenos Aires, Rosario, and Santa Fé.

The General San Martín Railway services follow closely those of the previous summer. A weekly high-speed day express, "El Sanjuanino," runs between Buenos Aires, Mendoza, and San Juan, and the day express "El Cuyano" connects the same places daily. The International train to Chile runs twice weekly, and the day express "El Champaqui" to the Córdoba Hills runs three times a week. Sleeping-car trains run as follows: "El Nihuil" to San Rafael twice weekly; "El Zonda" to San Juan twice weekly; and "El Sierras Grandes" to the Córdoba Hills three times a week.

The General Belgrano Railway introduces a daily three-coach diesel express "El Capillense" between Buenos Aires and Capilla del Monte in the Córdoba Hills, covering the 519½ miles in 14½ hr.

#### **Sleeping Car Service to the North**

A new weekly sleeping-car express runs direct between Buenos Aires, Tucumán, Salta, and Jujuy. The 1,015 miles between Buenos Aires and Jujuy are covered in only 34½ hr., as against 42 hr. 20 min. by ordinary services. The "Panamericano" to Bolivia and Peru runs once weekly, and a sleeping-car express to La Quiaca runs three times a week. The local services between Buenos Aires and Del Viso have been considerably augmented as a result of the introduction of the new Westinghouse diesel-electric locomotives.

The General Roca Railway has considerably increased its services to Mar del Plata. There are three day expresses running six days a week, one daily, one at weekends, and a weekend sleeping-car train. To Necochea there is an express every day and a weekend sleeping-car train. Bahía Blanca is served by a diesel express once weekly, taking 6½ hr. for the 400 miles, a daily stopping train, a night train with sleeping-cars and another with day coaches, the last two running daily. Neuquén and Zapala have an express service three times weekly and a stopping train daily. Bariloche and the Lake District have a direct sleeping-car

express four times a week and a stopping sleeping-car train twice a week.

On all lines there has been a speeding-up and a general increase in the number of trains, too numerous to detail in these columns.

## **CANADA**

### **New Refrigerator Vans for C.P.R.**

The first units of an order for 350 new steel refrigerator vans for the Canadian Pacific Railway have arrived in Montreal from the National Steel Car Corporation, Hamilton. They include a new locking mechanism on sliding doors that is easier and faster to operate. They should all be in service early this year. The vans measure 40 ft. in length inside, and have a capacity of 2,268 cu. ft.

## **TUNISIA**

### **Compagnie Fermière des Chemins de fer Tunisiens**

The Tunisian section of the Tunisian Grand Council recently rejected the scheme evolved by the Tunisian Government for a new convention with the above mentioned railway company, and declared itself in favour of nationalisation. This would mean that the lease of the railway system to the company would not be renewed. By this move the Tunisian section is in opposition to the French section of the Council which had decided on a wait-and-see policy pending a Government statement on transport, especially co-ordination between railways and road transport. As mentioned in the June 10, 1949, issue, the lease under which the company operates the Government-owned railways, which expired as from the end of 1948, had been extended provisionally for another year.

## **SWITZERLAND**

### **Geneva-La Praille Line Opened**

The Geneva Cornavin to La Praille line, some 2½ miles long, which was mentioned in the December 9 issue, was opened to traffic on December 15. It is the first section of a line which eventually will join the Cornavin and Eaux-Vives stations at Geneva. Eaux-Vives is situated on the higher part of the town beyond the Rhône. The distance between La Praille and Eaux-Vives is about 3½ miles. La Praille is expected to become the most important goods station in Geneva as it is in the growing industrial quarter in the southern suburbs.

Leaving Geneva Cornavin the new single-track line runs parallel to the Geneva-Bellegarde (France) main line for a few hundred yards. To provide the necessary space the deep cutting west of Cornavin Station had to be widened on its southern side. Near St. Jean the line turns southward and describing a wide curve reaches the new three-span bridge known as "Pont de la Jonction" because of its situation immediately south of the junction between the Arve and the Rhône rivers. The bridge is double track and is 715 ft.

long, and was completed in October, 1947. (An illustration of it appeared in our December 9, 1949, issue.)

The eastern end of the bridge is close to La Bâtie Tunnel, also double track, 3,536 ft. long, 28 ft. wide, and 20½ ft. high. It is lined throughout, the thickness of the lining varying between 17½ and 21½ in. The tunnel has a gradient of 1 in 125 descending towards La Praille. Approach to the tunnel from La Praille is by two curves of 9 ch. 62 ft. radius. The tunnel was pierced on June 30, 1948.

The next section to be taken in hand is that between La Praille and Vernier-Meyrin, where the new line should turn northward towards Eaux-Vives Station. This terminus is owned by the French National Railways and is the terminal point of a 3.7-mile double-track line from Annemasse opened in 1888. This link provides a direct connection between Switzerland and the French railways in the Savoy region, but its importance has been handicapped by the absence of through connection with the Swiss railway system, a gap to be filled by the La Praille-Vernier-Meyrin-Eaux-Vives section of the junction line.

An alternative scheme avoiding Eaux-Vives and including a short cut between the future Vernier-Meyrin Station (which would be located near the frontier) and Annemasse Station across the border has been proposed. A decision as to which of the two connections is to be given preference will have to come from the French railways. Eaux-Vives Station handles much French wine traffic, which has grown from a monthly average of 140 wagons in 1944 to more than 500 wagons in 1948.

## **FRANCE**

### **Electrification**

The twelve-year plan provides for electrification of 1,125 route-miles, including 320 route-miles of the Paris-Lyons line. This would save 1,585,000 tons of coal a year in addition to the 1,320,000 tons saved through existing electrifications. Expenditure at the end of 1949 will have amounted to fr. 26,500 million. In 1953 the expenditure will reach a total of fr. 54,000 million.

## **FINLAND**

### **Locomotives and Rolling Stock**

Recent reports estimate the needs of the State railways for goods rolling stock at some 5,000 new wagons. In 1948 the wagon works at Pasila, 1½ miles north of Helsinki, turned out 407 goods wagons and 51 tank wagons; in 1949 its output was to reach 1,100 goods wagons and 51 tank wagons. Thirty-five passenger coaches were to be completed as against 62 in 1948.

Steam locomotives in service in 1948 totalled 796, as compared with 767 in 1947, and of the first total ten were Finnish-built. An order for 20 locomotives placed with the Danish industry is expected to be completed in the near future.



## Determining Working Loads and Stresses

### Stressing the crank axles of a three-cylinder simple express-passenger locomotive of the 4-6-2 type

By Geo. W. McArd, A.M.I.Mech.E.

ALTHOUGH the stressing of a crank axle for two-cylinder and four-cylinder engines presents little difficulty, the case is rather more complex when three cylinders are involved, because of the changing amounts, positions and directions of the loads on the three pistons. To ascertain, as a guide for future use, the positions of the cranks when the highest working stresses occurred in the crank axle and the way in which the loading was compounded, the author some years ago developed a case in hand on the lines described herewith. The engines were three-cylinder simple express-passenger locomotives of the 4-6-2 type and their leading features for present purposes are given below:—

Cylinders (3) ... 19 in. dia. × 26 in. stroke  
Coupled wheels, dia. ... 6 ft. 2½ in.  
Boiler pressure ... 225 lb. per sq. in.  
Maximum load on drivers ... 18 tons per axle  
Length of connecting rods (outer) ... 10 ft. 6 in.  
" " (inner) ... 7 ft. 2 in.

To simplify the working, all cylinders are assumed to be on horizontal centre lines and all cranks at 120 deg. spacing.

The lines followed, which also proved exceptionally useful in arriving at the working loads carried by the coupling and connecting rods, necessitated a considerable amount of data from which the loads occurring in each of the 24 crank positions, could be ascertained for each axle. Fig. 1 shows the crank positions taken, and those numbered 17 and 9 are the relative locations of the right and left cranks, respectively, when the centre crank is in the No. 1 position. This later will be recognised as an essential preliminary.

Another factor to be ascertained was the effective steam pressure operating on the several pistons, for any given crank

location. To obtain this, a theoretical steam diagram was prepared for each of the strokes (forward and backward) and the pressure taken for the piston position corresponding to the particular crank point involved. Finally, the effective crank arms were determined for each crank position and the results obtained are given in Table I at the foot of this page.

From the above, the maximum and minimum total torques to be absorbed

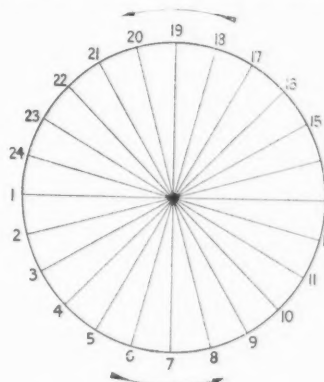


Fig. 1—Crank position to be considered

among the three coupled axles, will be seen to amount to 596 and 535 in.-tons respectively, and the mean total torque for the twenty-four positions of each revolution, when working under full-load conditions, works out at 569 in.-tons.

If the maximum torque equals 596 in.-tons, the maximum tractive force will be found to equal 35,900 lb. (16 tons) at the rail. Furthermore, the mean and mini-

mum torques of 569 and 535 in.-tons produce tractive force values of 34,216 and 32,200 lb. respectively (15.27 and 14.36 tons); adhesive factors for the three tractive force values would be:—

$$\begin{aligned}(3 \times 18) 16 &= 3.37 \\ 54 \cdot 15.27 &= 3.54 \text{ and} \\ 54 \cdot 14.36 &= 3.76\end{aligned}$$

Using the well-known formula for the tractive force of a three-cylinder simple locomotive of 1.5d<sup>2</sup> P/D and the mean tractive force of 34,216 lb., as given above, the mean effective pressure is found to be approximately 182 lb. per sq. in., the ratio to the full boiler pressure working out at 81 per cent. If a drop of 10 lb. is allowed between boiler and steamchest, the mean effective steam pressure in the cylinder thus becomes approximately 85 per cent. of the steamchest pressure.

We now may proceed to analyse the loads which the axles and driving rods—connecting and coupling—must sustain in each of the 24 crank positions selected, assuming no slipping at any wheel tread. The development of the first six positions only is given below in detail, to show the method, but the load on any rod, and its character, namely, tensional, or compressive, can be arrived at for any crank position by reference to the series of curves shown in Fig. 11. The figures shown for each of the crank positions give symbols which represent the following rods:—

- A—Centre connecting rod
- B—R.H. connecting rod
- C—L.H. connecting rod
- D—Leading section R.H. coupling rod
- E—Leading section L.H. coupling rod
- F—Trailing section R.H. coupling rod
- G—Trailing section L.H. coupling rod

TABLE I—DATA USED FOR OBTAINING TORQUES AND FACTOR OF ADHESION FOR ALL CRANK POSITIONS

Crank position	Effective steam pressure in cyls. (from diagram) PSI.		Piston loads (tons)		Effective crank arm (in.)	Torque (in.-tons)		Crank positions			Torque (tons-in.)			Total torque (tons-in.)	Adhesion factor
	Centre cyl.	R. & L. cyls.	Centre	R. & L.		Centre	R. & L.	Centre	R.H.	L.H.	Centre	R.H.	L.H.		
1	172	172	21.8	21.8	3.375	78	78	1	17	9	78	293	245	538	3.74
2	182	182	23.1	23.1	3.375	78	78	2	18	10	78	326	178	582	3.46
3	202	201	25.6	25.5	6.5	166	165	3	19	11	166	338	72	576	3.5
4	205	205	26	26	9.2	239	239	4	20	12	239	326	—	565	3.56
5	205	205	26	26	11.25	293	293	5	21	13	293	260	—	553	3.64
6	205	205	26	26	12.55	326	326	6	22	14	326	182	77	585	3.44
7	205	205	26	26	13	338	338	7	23	15	338	92	163	593	3.39
8	200	203	25.4	25.7	12.55	319	323	8	24	16	319	—	239	558	3.62
9	170	172	21.5	21.8	11.25	242	245	9	1	17	242	—	293	535	3.48
10	150	153	19	19.4	9.2	175	178	10	2	18	175	78	326	579	3.51
11	85	87	10.77	11	6.5	70	72	11	3	19	70	165	338	573	3.56
12	20	20	2.54	2.54	3.375	Ignore	Ignore	12	4	20	—	239	326	565	3.64
13	172	172	21.8	21.8	3.375	77	77	13	5	21	77	293	260	553	3.44
14	180	180	22.8	22.8	3.375	77	77	14	6	22	77	326	182	585	3.39
15	198	198	25.1	25.1	6.5	163	163	15	7	23	163	338	92	593	3.57
16	205	205	26	26	9.2	239	239	16	8	24	239	323	—	562	3.74
17	205	205	26	26	11.25	293	293	17	9	1	293	245	—	538	3.46
18	205	205	26	26	12.55	326	326	18	10	2	326	178	78	582	3.5
19	205	205	26	26	13	338	338	19	11	3	338	72	165	575	3.56
20	205	205	26	26	12.55	326	326	20	12	4	326	—	239	565	3.62
21	184	182	23.3	23.1	11.25	263	260	21	13	5	263	—	293	556	3.43
22	158	156	20	19.8	9.2	184	182	22	14	6	184	77	326	587	3.37
23	115	112	14.6	14.2	6.5	95	92	23	15	7	95	163	338	596	3.57
24	30	30	3.81	3.81	3.375	Ignore	Ignore	24	16	8	—	239	323	562	3.57

and the rod diagrams beneath the main force diagrams show the manner of loading for the R.H. (upper diagram) and L.H. (lower diagram) rods, that is, compression (*c*), or tension (*t*), and the arc of contact of the bush and the crankpin. Values for A, B, C, D, E, F, and G are stated for each position.

### Crank Position No. 1

Centre cylinder position (1)—Piston load 21·8 tons—No torque

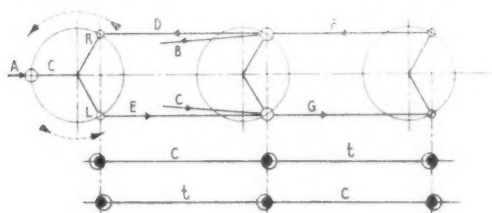


Fig. 2—Diagram illustrating loads in rods for crank position No. 1

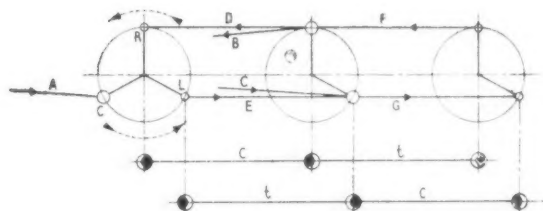


Fig. 4—Diagram illustrating loads in rods for crank position No. 3

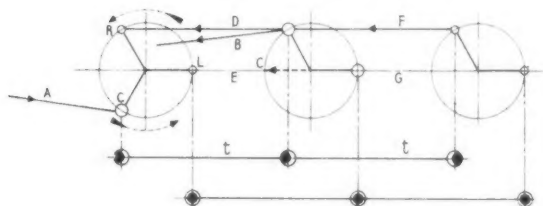


Fig. 6—Diagram illustrating loads in rods for crank position No. 5

R.H. cylinder position (17)—Piston load 26 tons—Torque 293 in.-tons

L.H. cylinder position (9)—Piston load 21·8 tons—Torque 245 in.-tons.

Total torque = 538 in.-tons, or  $538 \div 3 = 179$  in.-tons per axle.

To this amount, the inside cylinder contributes nothing, so the excess of 359 in.-tons supplied by the second driver will be passed in equal amounts through each coupling rod, to the first driver and the

trailing coupled axle, as the crank arms for the two outside cylinders are equal. The effective arm for torque when the outside cranks are placed as shown in Fig. 2, is 11·25 in., and the loads in each section of the coupling rods will be  $(359 \times 0·25) / 11·25$ , or 7·97 tons. In Fig. 2:—

A—21·8 tons (*c*)      B—26 tons (*t*)  
C—21·8 tons (*c*)      D—7·97 tons (*c*)  
E—7·97 tons (*t*)      F—7·97 tons (*t*)  
G—7·97 tons (*c*)

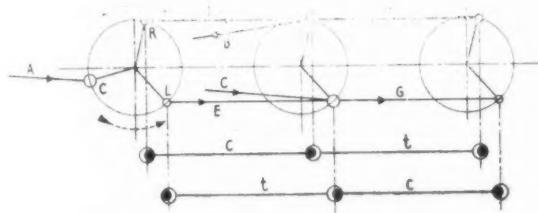


Fig. 3—Diagram illustrating loads in rods for crank position No. 2

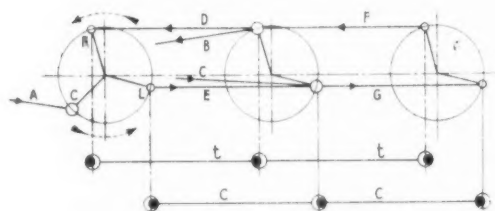


Fig. 5—Diagram illustrating loads in rods for crank position No. 4

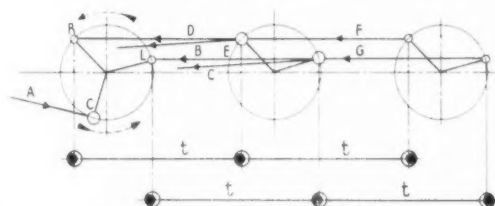


Fig. 7—Diagram illustrating loads in rods for crank position No. 6

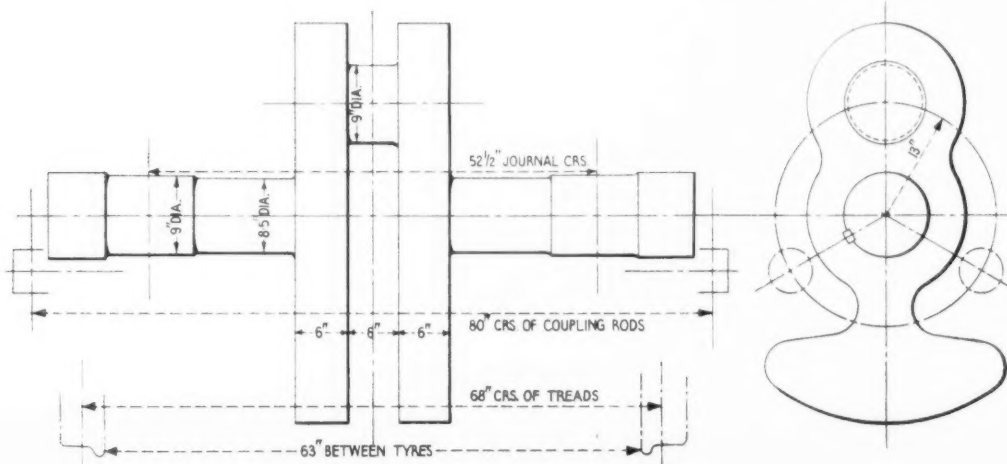


Fig. 8—Leading particulars of crank axle

**Crank Position No. 2**

Centre cylinder position (2)—Piston load 23.1 tons—Torque 78 in.-tons  
 R.H. cylinder position (18)—Piston load 26 tons—Torque 326 in.-tons  
 L.H. cylinder position (10)—Piston load 19.4 tons—Torque 178 in.-tons  
 Total torque = 582 in.-tons, or  $582/3 = 194$  in.-tons per axle.

Of this amount, the inside cylinder contributes 78 in.-tons, leaving the balance of 116 in.-tons to come from the coupling rods. Then  $12.55 (0.9659 x) \div 9.2 (0.707 x) = 116$  in.-tons, and  $x = 6\frac{1}{2}$  in.-tons, from which we get  $0.9659 \times 6\frac{1}{2}$ , for 6 tons along the front R.H. rod, and  $0.707 \times 6\frac{1}{2}$ , or 4.4 tons along the front L.H. rod.

The combined torque for the R.H. and L.H. cylinders =  $(326 + 178)$  in.-tons, or 504 in.-tons. From this deduct the amount required for the centre axle, that is, 194 in.-tons, leaving 310 in.-tons to assist, through the coupling rods, in operating the L. and T. axles. Then,  $12.55 (0.9659 x) \div 9.2 (0.707 x) = 310$  in.-tons, from which we find  $x = 16.7$  tons.

$$0.9659 \times 16.7 = 16.1 \text{ tons, and } 0.707 \times 16.7 = 11.8 \text{ tons.}$$

Now, 16.1 and 11.8 represent the power developed in the R.H. and L.H. cylinders in excess of the centre axle requirements, and are the loads passed through the side rods to the front and rear axles. But the front rods have been shown to receive 6 and 4.4 tons for R.H. and L.H. rods respectively. The R.H. and L.H. rods to the trailing axle, therefore, carry  $(16.1 - 6)$  and  $(11.8 - 4.4)$ , or 10.1 and 7.4 tons, respectively. In Fig. 3:—

A—23.1 tons (c)    B—26 tons (t)  
 C—19.4 tons (c)    D—6 tons (c)  
 E—4.4 tons (t)    F—10.1 tons (t)  
 G—7.4 tons (c)

**Crank Position No. 3**

Centre cylinder position (3)—Piston load 25.6 tons—Torque 166 in.-tons  
 R.H. cylinder position (19)—Piston load 26 tons—Torque 338 in.-tons  
 L.H. cylinder position (11)—Piston load 11 tons—Torque 72 in.-tons  
 Total torque = 576 in.-tons, or  $576/3 = 192$  in.-tons per axle.

For the front axle, A contributes 166 in.-tons, leaving  $(192 - 166)$ , or 26 in.-tons, to be derived through the coupling rods from the R.H. and L.H. outside cylinders.

Then,  $13 x + 6.5 (0.5 x) = 26$  and  $x = 1.6$ .

The front R.H. coupling rod, therefore, will transmit 1.6 tons and the front L.H. rod 0.8 ton.

The combined torque for the R.H. and L.H. cylinders = 410 in.-tons.

The centre axle takes 192 in.-tons, leaving 218 in.-tons as the amount to be passed to the L. and T. axles through the coupling rods. Then,  $13 x + 6.5 (0.5 x) = 218$  in.-tons, from which we find  $x = 13.4$  tons and  $0.5 x = 6.7$  tons.

Now, 13.4 and 6.7 represent the total loads transmitted to the L. and T. axles

from the centre axle per R.H. and L.H. coupling rods respectively, and we know that the front R.H. and L.H. rods carry 1.6 and 0.8 tons, respectively; therefore, the rear R.H. coupling rod load  $13.4 - 1.6 = 11.8$  tons, and the rear L.H. rod load equals  $6.7 - 0.8 = 5.9$  tons. In Fig. 4:—

A—25.6 tons (c)    B—26 tons (t)  
 C—11 tons (c)    D—1.6 tons (c)  
 E—0.8 tons (t)    F—11.8 tons (t)  
 G—5.9 tons (c)

**Crank Position No. 4**

Centre cylinder position (4)—Piston load 26 tons—Torque 239 in.-tons  
 R.H. cylinder position (20)—Piston load 26 tons—Torque 326 in.-tons  
 L.H. cylinder position (12)—Piston load 0 tons—Torque 0 in.-tons.

(Due to compression occurring in the L.H. cylinder in this position of the crank, no torque can occur, and this cylinder, therefore, is regarded as dead.)

Total torque = 565 in.-tons, or 188 in.-tons per axle.

For the front axle, the centre cylinder contributes 239 in.-tons, or 51 in.-tons in excess of the torque required for that axle, and this will be transferred to the rear axle by the side rods as follows:—

$$12.55 (0.9659 x) \div 3\frac{1}{2} (0.2558 x) = 51 \text{ in.-tons, and } x = 3.94 \text{ tons.}$$

$$0.9659 x = 3.8 \text{ tons and } 0.2558 x = 1.1 \text{ tons.}$$

Therefore, the front R.H. and L.H. rods transmit 3.8 and 1.1 tons respectively from the leading to the trailing axle.

The combined torque for the R.H. and L.H. cylinders equals 326 in.-tons, of which the centre axle absorbs 188 in.-tons, leaving the balance of 138 in.-tons to be transmitted to the rear axle, in addition to the 51 in.-tons from the leading axle. The total torque to be transmitted to the rear axle by the side rods F. and G. equals  $138 + 51$ , or 189 in.-tons.

$$12.55 (0.9659 x) \div 3\frac{1}{2} (0.2558 x) = 189 \text{ in.-tons, and } x = 14.6 \text{ tons.}$$

$$0.9659 x = 14.1 \text{ tons. } 0.2558 x = 3.73 \text{ tons.}$$

In Fig 5:—

A—26 tons (c)    B—25 tons (t)  
 C—    D—3.8 tons (t)  
 E—1.1 tons (c)    F—14.1 tons (t)  
 G—3.73 tons (c)

**Crank Position No. 5**

Centre cylinder position (5)—Piston load 26 tons—Torque 293 in.-tons  
 R.H. cylinder position (21)—Piston load 23.1 tons—Torque 260 in.-tons  
 L.H. cylinder position (13)—Piston load 21.8 tons—Torque —

Total torque = 553 in.-tons, or 184 in.-tons per axle.

For the front axle, the centre cylinder contributes 293 in.-tons, or 109 in.-tons in excess of the torque required for that axle, and this will be transmitted to the rear axle by the R.H. coupling rod alone, as the L.H. rod is on dead centre.

$$11\frac{1}{2} x = 109 \text{ in.-tons, and } x = 9.7 \text{ tons.}$$

The combined torque for the R.H. and L.H. cylinders is 260 in.-tons, of which the centre axle absorbs 184 in.-tons.

Therefore  $(260 - 184)$ , or 76 in.-tons, must be transmitted to the rear axle in addition to the 109 in.-tons coming from the leading axle. The total torque to be transmitted to the rear axle thus equals  $76 + 109$ , or 185 in.-tons, and with the L.H. coupling rod out of action, the whole must pass through the R.H. side rod.

$$11\frac{1}{2} (0.866 x) = 185 \text{ in.-tons, and } x = 19 \text{ tons. } 0.866 x = 16.4 \text{ tons.}$$

In Fig. 6:—

A—26 tons (c)    B—23.1 tons (t)  
 C—21.8 tons (t)    D—9.7 tons (t)  
 E—    F—16.4 tons (t)  
 G—   

**Crank Position No. 6**

Centre cylinder position (6)—Piston load 26 tons—Torque 326 in.-tons  
 R.H. cylinder position (22)—Piston load 19.8 tons—Torque 182 in.-tons  
 L.H. cylinder position (14)—Piston load 22.8 tons—Torque 77 in.-tons

Total torque = 585 in.-tons, or 195 in.-tons per axle.

The front axle absorbs 195 in.-tons of the 326 in.-tons provided by the centre cylinder, and the balance of 131 in.-tons is passed to the rear axle by the front R.H. and L.H. side rods as follows:—

$$9.2 (0.707 x) \div 3.375 (0.2558 x) = 131 \text{ in.-tons, and } x = 17.8 \text{ tons.}$$

$0.707 x = 12.6$  tons along R.H. rod, and  $0.2558 x$  or 4.55 tons, along L.H. rod.

The combined torque for the R.H. and L.H. cylinders is 259 in.-tons, of which  $(259 - 195)$ , or 64 in.-tons, goes to the rear axle. The total passed to the rear axle is, therefore  $131 + 64$ , or 195 in.-tons, allotted through the rods thus:—

$$9.2 (0.707 x) \div 3.375 (0.2558 x) = 195 \text{ in.-tons, and } x = 26.5 \text{ tons.}$$

$$0.707 x = 18\frac{1}{2} \text{ tons (R.H. rod).}$$

$$0.2558 x = 6.77 \text{ tons (L.H. rod).}$$

In Fig. 7:—

A—26 tons (c)    B—19.8 tons (t)  
 C—22.8 tons (t)    D—12.6 tons (t)  
 E—4.55 tons (t)    F—18.75 tons (t)  
 G—6.77 tons (t)

Having found the loads occurring for every crank position, it now is possible to tabulate the conditions for the leading crank axle as concerns the horizontal bending moments and the torques for each of the twenty-four crank positions, and to combine with the vertical bending moment caused by the spring loads acting at the journal centres, namely, 52.5 in.-tons. These values are shown in the table below, for three different positions in the axle, namely, the L.H. journal centre, the mid-point of the crankpin for the inside cylinder, and the R.H. journal centre, using the following abbreviations:—

HBM—Horizontal bending moment in in.-tons  
 VBM—Vertical bending moment in in.-tons  
 RBM—Resultant bending moment in in.-tons  
 T—Torque in in.-tons  
 ETM—Equivalent twisting moment in in.-tons  
 Z—Modulus of section for 8½ in. dia.  
 f—Stress in tons per sq. in.



TABLE II—STRESSES IN CRANK AXLE AT POINTS STATED FOR EACH CRANK POSITION

TABLE II—STRESSES IN CRANK AXLE AT POINTS STATED																					
Crank position	Through L.H. journal							Through centre crankpin							Through R.H. journal						
	HBM	VBM	RBM	T	ETM	Z	f	HBM	VBM	RBM	T	ETM	Z	f	HBM	VBM	RBM	T	ETM	Z	f
1	108	52.5	120	—	—	60	2.00	286	52.5	291	—	—	60	4.9	108	52.5	120	—	—	60	2.0
2	60	52.5	80	56	178	120	1.48	313	52.5	317	—	—	60	5.3	81	52.5	97	22	196	120	1.6
3	11	52.5	54	91	160	120	1.33	340	52.5	344	—	—	60	5.7	22	52.5	57	75	151	120	1.3
4	15	52.5	55	98	167	120	1.4	323	52.5	328	—	—	60	5.5	51	52.5	74	141	233	120	1.9
5	—	52.5	52.5	92	158	120	1.3	276	52.5	281	—	—	60	4.7	131	52.5	141	201	387	120	3.2
6	62	52.5	82	113	221	120	1.9	225	52.5	231	—	—	60	3.9	170	52.5	178	213	456	120	3.8
7	146	52.5	155	169	385	120	3.2	195	52.5	209	—	—	60	3.5	146	52.5	155	169	385	120	3.2
8	173	52.5	181	210	459	120	3.8	215	52.5	221	—	—	60	3.7	63	52.5	83	109	220	120	1.9
9	77	52.5	93	153	272	120	2.3	245	52.5	251	—	—	60	4.2	5	52.5	52.5	89	155	120	1.3
10	18	52.5	56	80	154	120	1.3	255	52.5	261	—	—	60	4.4	5	52.5	53	95	162	120	1.35
11	101	52.5	114	—	—	60	1.9	168	52.5	176	—	—	60	2.9	50	52.5	73	70	174	120	1.45
12	133	52.5	143	29	289	120	2.4	52	52.5	74	—	—	60	1.2	97	52.5	111	29	225	120	1.9
13	111	52.5	123	—	—	60	2.1	286	52.5	291	—	—	60	4.9	111	52.5	123	—	—	60	2.05
14	60	52.5	80	56	178	120	1.5	311	52.5	316	—	—	60	5.3	83	52.5	98	21	199	120	1.66
15	15	52.5	55	92	162	120	1.35	337	52.5	342	—	—	60	5.7	29	52.5	60	71	142	120	1.2
16	14	52.5	54	97	165	120	1.4	322	52.5	327	—	—	60	5.45	52	52.5	74	142	160	120	1.33
17	—	52.5	52.5	90	156	120	1.3	273	52.5	278	—	—	60	4.6	137	52.5	147	203	398	120	3.3
18	62	52.5	82	112	221	120	1.8	224	52.5	230	—	—	60	3.8	172	52.5	180	214	280	120	2.3
19	152	52.5	161	169	395	120	3.3	189	52.5	196	—	—	60	3.3	152	52.5	161	169	395	120	3.3
20	179	52.5	187	216	473	120	3.94	219	52.5	225	—	—	60	3.75	65	52.5	84	110	222	120	1.85
21	94	52.5	108	170	309	120	2.58	259	52.5	264	—	—	60	4.4	—	52.5	52.5	93	159	120	1.3
22	12	52.5	54	87	156	120	1.3	266	52.5	271	—	—	60	4.5	4	52.5	53	97	164	120	1.37
23	87	52.5	102	17	205	120	1.7	214	52.5	220	—	—	60	3.7	43	52.5	68	78	171	120	1.4
24	132	52.5	142	29	287	120	2.4	68	52.5	86	—	—	60	1.4	96	52.5	110	29	224	120	1.87

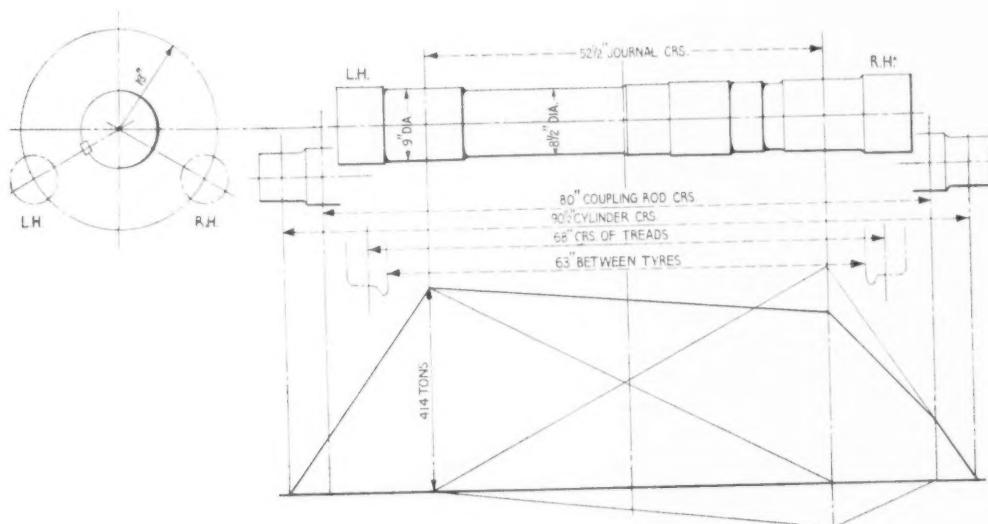


Fig. 9—Leading particulars of second driving axle

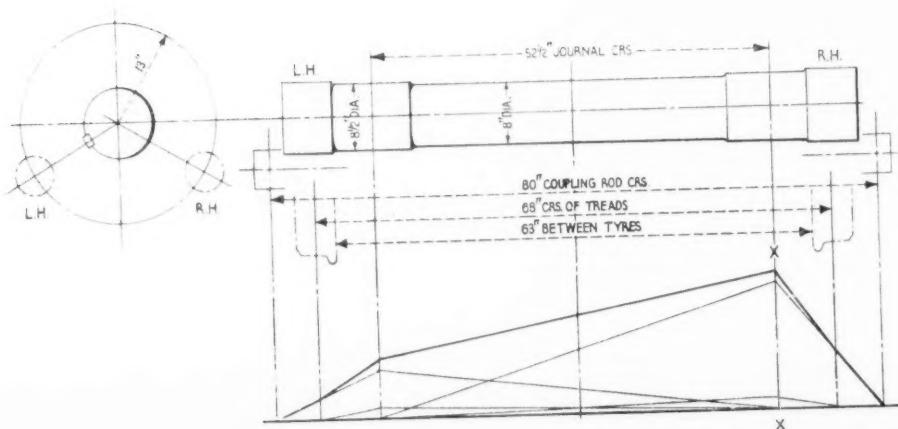


Fig. 10—Leading particulars of rear coupled axle

An additional load comes on the axle due to the wheel reaction at the rail, but this is relatively small and has been ignored except for the rear axle (see Table II).

The axle, as built, is shown in Fig. 8, but at an early stage in its design the desirability of balancing the revolving parts for the centre cylinder in the wheels rather than on the crank webs, was considered. To do so, however, increased the stress in the axle beyond an acceptable limit, if the locomotive was considered to be running on a down grade at the higher speeds not uncommon for main line stock, and balanced cranks were adopted. The figures below, give the stress at the inside crankpin (with the crank on the bottom centre) when running at a speed of 90 m.p.h. on a down grade.

Unbalanced masses at 13 in. radius = 1,225 lb.

Revolutions per sec. of driving wheels when travelling at 90 m.p.h. = 6.78.

The centrifugal force caused by the unbalanced masses when travelling at 6.78 r.p.s. = 33.3 tons and the bending moment at the axle centre due to this .. = 437 in.-tons

Add to this the bending moment due to the static load .. = 53 ..

Total bending moment = 490 ..

Z (if crankpin is worn to  $8\frac{1}{2}$  in. dia.) .. = 60.29

giving a stress equal to 8.15 tons per sq. in.

For the second driving axle, the conditions are assumed as shown in Fig. 6 to be the worst, the axle with its bending moment diagram being shown in Fig. 9 on page 14.

Bending moment due to load on R.H. piston =  $23.1 \times 19$  .. = 440 in.-tons

Bending moment due to load in R.H. coupling rod .. =  $6.7 \times 13.75$  = 92 in.-tons

Bending moment due to load on L.H. piston =  $21.8 \times 19$  .. = 414 in.-tons

From Fig. 9, it will be seen that the maximum bending moment occurs at the centre of the L.H. journal, and equals 414 in.-tons.

CONVENTION ON ELECTRIC RAILWAY TRACTION.—In the report in our December 23, 1949, issue the following should have been shown as representatives of The English Electric Co. Ltd.: Messrs. S. C. Lyon, P. L. Mardis, W. G. Jowett, and E. A. Binney.

TIMBER DEVELOPMENT ASSOCIATION: DIRECTOR'S VISIT TO FINLAND.—The recent visit to Finland (with a brief call in Sweden) of Mr. Phillip O. Reece, Director of the Timber Development Association, was made at the invitation of the Finnish Sawmill Members' Association and of the Finnish Timber Engineers' Association, to

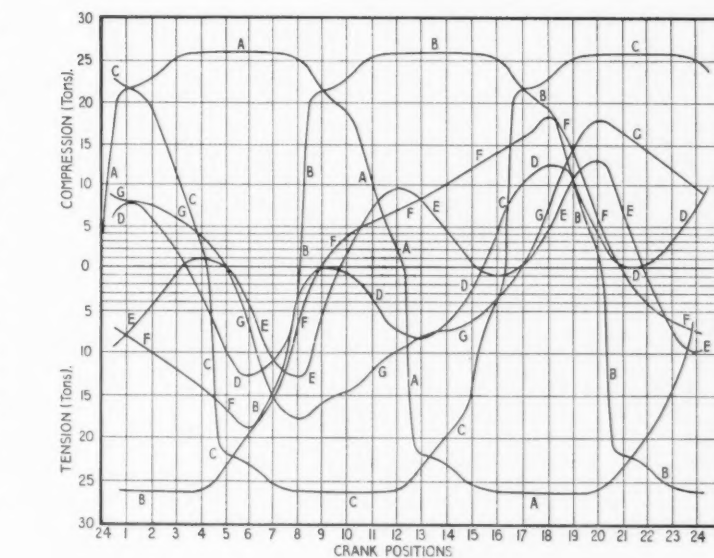


Fig. 11—Graphed loadings in coupling and connecting rods

Bending moment due to static load .. = 52.5 in.-tons  
Resultant bending moment .. = 418 ..  
Torque .. = 92 ..  
Equivalent twisting moment .. = 845 ..  
Z .. = 120.6 ..  
Stress .. = 7.0 tons per sq. in.

For the rear, or third, coupled axle, shown in Fig. 10, the worst conditions are probably those indicated in Fig. 7, where the torque developed by the coupling rods equals 195 in.-tons per axle.

Force at wheel rim =  $195 (37.25 \times 2)$ , or 2.62 tons at each tread.

Bending moment due to R.H. coupling rod =  $18.75 \times 13.75$  .. = 258 in.-tons

Bending moment due to R.H. wheel =  $2.62 \times 7.75$  .. = 20 ..

Bending moment due to L.H. coupling rod =  $6.77 \times 13.75$  .. = 93 ..

Bending moment due to L.H. wheel .. = 20 ..

Maximum bending moment in horizontal plane .. = 278 .. (at XX)

Bending moment in vertical plane due to journal loads .. = 54 in.-tons  
Combined bending moment .. = 283 ..  
Torque required by L.H. wheel .. = 98 ..  
Torque developed through L.H. coupling rod .. = 23 ..  
Torque transmitted through axle from R.H. side .. = 75 ..  
Equivalent twisting moment .. = 576 ..  
Resisting modulus for journal when worn to 8 in. dia. .. = 100.5

The stress, therefore, equals  $5\frac{1}{2}$  tons per sq. in.

When calculating the actual strength of the various rods, the worst pre-slipping conditions would be taken, but it is desirable to know, in addition, the maximum compressive and tensional loads which would be sustained under normal steam pressure, and the values derived from the above analysis proved extremely useful. These are graphed in Fig. 11 for easy reference, those shown above the centre line representing compressive forces, and those below representing tensional.

which he read a paper on the use of timber in Britain, with special reference to improved methods of utilisation.

IRISH BOAT TRAINS PANTRY SERVICE.—A pantry service of light refreshments will shortly be provided by the Railway and Hotels Executives on the following late night Irish boat services: 8.40 p.m. "Irish Mail," Euston to Holyhead; 12.55 a.m. "Irish Mail," Holyhead to Euston. Two third class compartments in a coach on each of these trains are being fitted up as a pantry giving a working space of approximately 12 ft. 6 in.  $\times$  6 ft. The floor is covered with sheet lead and fitted

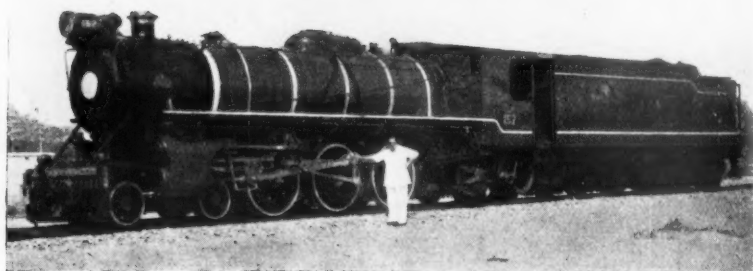
with timber floor gratings, in sections to facilitate easy removal for cleaning. Included in the pantry equipment is a gas-fire range, an electric refrigerator, and a pressure boiler for making tea, coffee, and so on. In addition to ample cupboard space a clothes cupboard has been provided for the staff.

DIESEL ENGINE USERS ASSOCIATION.—A paper on "Fuel Injection in Modern Oil Engines" will be read before the Diesel Engine Users Association by Mr. W. A. Green, on January 19. The meeting will be held at 2.30 p.m. at Caxton Hall, Westminster, London, S.W.1.

## Pacific Locomotives for Jodhpur Railway, India

*Order for ten locomotives built to the requirements of the Jodhpur Railway by Baldwin Locomotive Works*

*By P. R. Agarwal, B.Sc.(Eng.), M.I.E.(India), M.I.Loco.E., A.M.I.Mech.E.,  
Chief Mechanical Engineer, Jodhpur Railway*



*Metre-gauge Pacific locomotive finished in Jodhpur Railway livery and ready for service*

THE Jodhpur Railway of India has obtained ten 4-6-2 type locomotives from the Baldwin Locomotive Works, Philadelphia, U.S.A. The locomotives have been built to the specifications of the Jodhpur Railway, and have been designed to come within the Indian Railways diagram limitations for metre gauge, and to have a maximum axle-load on the driving axles of 10 tons 10 cwt. and on carrying axles of 11 tons 10 cwt.

The main bar-frames are rolled steel, and the two cylinders, which are of close-grained cast iron, are 15½ in. dia. by 26 in. stroke. The cylinders are also provided with four relief valves of the spring-loaded type and with bye-pass valves. The piston valves are 10 in. in dia. The piston rods are ground, keyed to crossheads and securely fastened to piston heads; and are of sufficient length to allow removal of the heads,

without disturbing the gland packing. The crosshead is of Laird type, with bearings in bronze. Walschaerts valve gear is used with cut-off arranged to provide a mean effective pressure of 77 per cent. The eccentric crankpin is equipped with roller bearings.

The coupled wheels are 4 ft. 3 in. dia. and are spaced 5 ft. 3 in. apart; the total engine wheelbase is 28 ft. 7 in. The wheel centres are of cast steel and tyres are held by shrinkage and through bolts; only the main wheels are cross balanced. S.K.F. roller bearings have been provided on all bogie, coupled, radial, and tender axles.

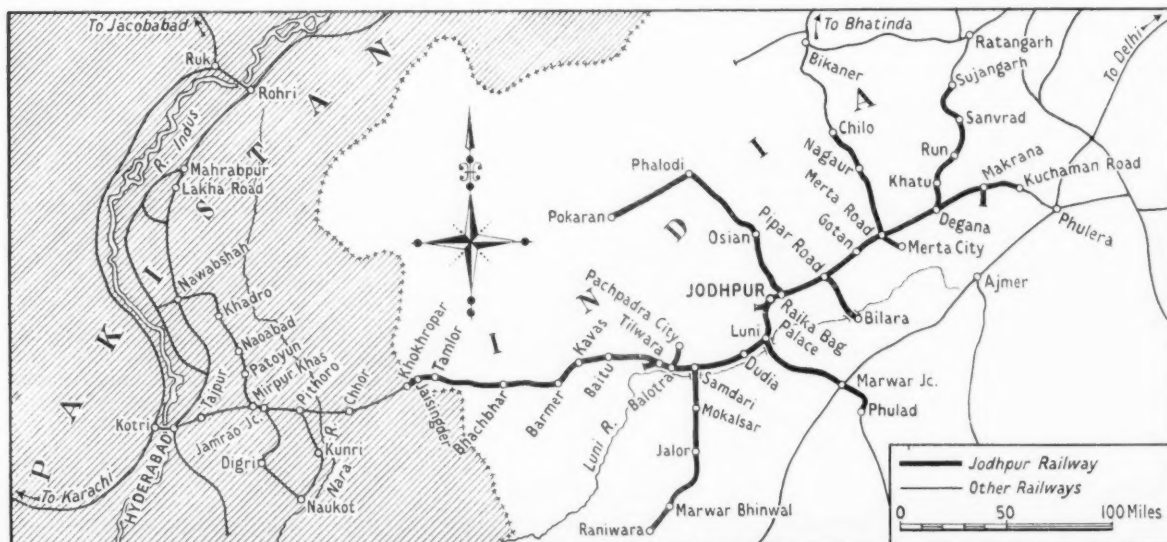
The coupling rods are of I section, and side rods, which are of rectangular section, are made of special high tensile steel. The little ends of the connecting rod and the leading and trailing end of the side rods are provided with solid bronze bushes. The big end of the con-

necting rod and the driving side rod ends have also been provided with S.K.F. roller bearings.

The boiler is designed to work at a pressure of 200 lb. per sq. in. and is of riveted construction. The boiler dia. at the smokebox end is 5 ft. and the plate thickness ¾ in. Twenty-one flue tubes, 5½ in. dia., and 84 boiler tubes 2 in. dia. and 15 ft. 6 in. in length, have been provided. The tubes and flues with copper ferrules are swaged at ends in firebox tube sheet and welded.

The principal dimensions of the locomotive are as follow:—

Gauge	3 ft. 3½ in.
Cylinders	15½ in. dia. 26 in. stroke
Boiler, dia.	5 ft.
Working steam pressure	200 lb. per sq. in.
Heating surfaces:	
Firebox	112 sq. ft.
Combustion chamber	25 "
Arch tubes	16 "
Tubes	680 "
Flues	455 "
Total	1,288 "
Superheating surface	371 "
Grate area	30 "
Ratio, grate area to heating surface	1 to 42.9
Coupled wheels, dia.	4 ft. 3 in.
Bogie wheels, dia.	2 ft. 4½ in.
Radial wheels, dia.	2 ft. 6 in.
Tender wheels, dia.	2 ft. 4½ in.
Rigid wheelbase	10 ft. 6 in.
Total engine wheelbase	28 ft. 7 in.
" " and tender wheelbase	60 ft. 2 in.
Maximum axle-load, driving axles	10 tons 10 cwt.
" " carrying	11 tons 10 cwt.
Weights: Front truck	15 tons 16 cwt.
Driving wheels	31 tons 10 cwt.
Trailing truck	11 tons 6 cwt.
Total engine	58 tons 14 cwt.
Tender	64 tons 6 cwt.
Total, engine and tender	122 tons 18 cwt.
Tractive force at 77 per cent.	
M.E.P.	18,820 lb.
Ratio of adhesion	3.75



*Jodhpur Railway system and its connections*





4-6-2 locomotive for the Jodhpur Railway after completion at the Baldwin Locomotive Works

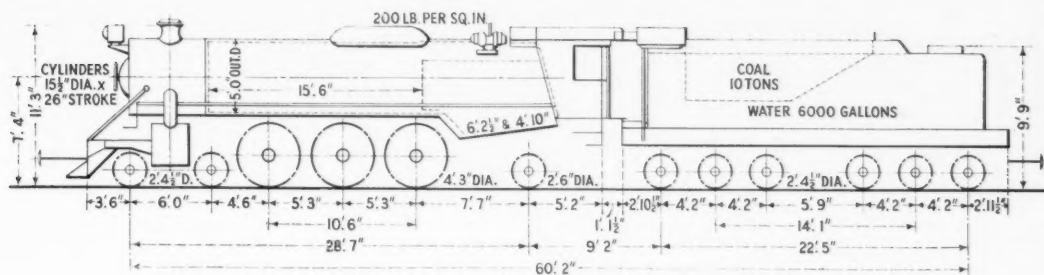


Diagram showing principal dimensions of the new Pacific locomotive

The firebox is 6 ft. 2½ in. long and 4 ft. 10 in. wide, made up of carbon steel, with riveted construction; the tubeplate is ⅝ in. thick, and the crown and side plates are ¾ in. thick. Provision has been made for vertical expansion of the firebox tubeplate. The firebox has been designed to burn grade II Indian coal of a calorific value of 6,000 calories, with a maximum ash content of 25 per cent. The total heating surface is 1,288 sq. ft. composed of 1,151 sq. ft. of tubes and flues and 112 sq. ft. of firebox and 25 sq. ft. of combustion chamber.

Stay bolts, crown stays and flexible

bolts are of iron, with Whitworth threads. The waterspace stays have ⅝-in. holes, 1¼ in. deep from the outside to indicate when broken in service. The total number of flexible bolts provided is 440. The boiler, including the dome, has air space under the jacket, but no lagging, except on the portion of the cab that is lagged with sectional magnesia lagging. Ample provision is made for washout and cleaning holes.

The boiler is fitted with automatic continuous blow-down valves, two Everlasting blow-off cocks, blower valve, two Ross safety valves, two Dewrance water gauges, two Hancock non-lifting

injectors, each of 2,000 gal. an hr. capacity. A type "A" multiple superheater has been provided and the grate is of the rocking type, fitted with drop plates.

The tender has two six-wheel bogies and is completely fitted with roller bearings. It has a coal capacity of 10 long tons and water capacity of 6,000 Imperial gal. The tender tank is of the steel well-braced rectangular water-bottom type. The aim in providing such a large tender capacity is to make the engine suitable for work on the desert sections of the railway, without watering *en route*.

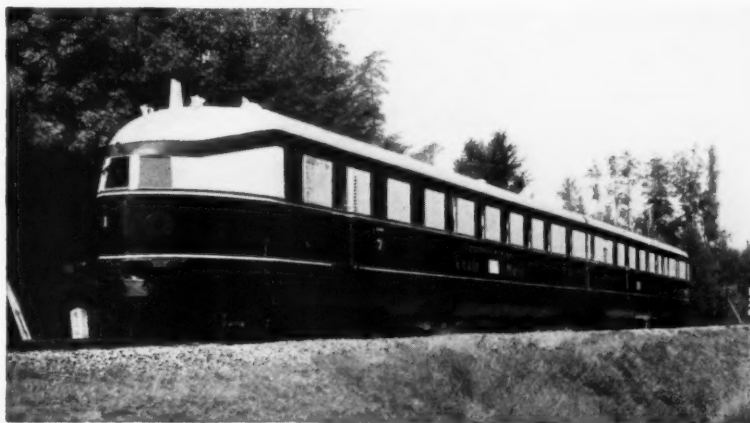
### Fast Diesel Railcar Services in Germany

RECENT revivals of fast passenger railcar services of the German Federal Railways include that of the "Flying Hamburger" ("Fliegender Hamburger") between Berlin and Hamburg; a new railcar service, the "Rhine-Main" ("Schnelltriebwagen Rhein-Main") also has been introduced between Basle and Frankfurt along the right bank of the Rhine via Freiburg, Offenburg (junction for the Black Forest line), Baden-Oos (junction for Baden Baden), Karlsruhe, and Mannheim.

The "Flying Hamburger" was re-inaugurated on September 3. In Berlin departures and arrivals are at the Friedrichstrasse and other stations on the Stadtbahn, the four-track main line of the German Federal Railways running east and west through the city and connecting certain main-line passenger stations.

The route followed appears to be that of the pre-war "Flying Hamburger," via Wittenberge and Büchen.

The distance of some 178 miles between Berlin Lehrter and Hamburg Hauptbahnhof was covered before the



Two-car set on the new "Rhein-Main" service between Frankfurt and Basle

war in 2 hr. 18 min. non-stop; at present, the slightly longer distance from Berlin Stadtbahn stations is covered in about 7 hr., including stretches of single track and halts at the Anglo-Russian zonal boundary for frontier formalities. It was hoped recently to reduce the time to 3 hr. in the near future. The railcars are of the type used for the pre-war "Flying Hamburger" and other high-speed services, two-car sets propelled by two Maybach diesel generators, one at either end, with a total of 1,200 h.p., seating 100 passengers, and, at least before the war, with kitchenette serving light refreshments.

Rail connections between the Russian Zone and Western Germany, incidentally, are being further improved by new steam-hauled expresses between Berlin and Hamburg, Cologne, Frankfurt, and

Munich, in addition to the existing Berlin-Cologne express, which hitherto has been the only public passenger train linking these territories.

The "Rhine-Main" was introduced on October 3, running on the following schedule:—

Basle Bad. Bhf.* dep.	6.35	Frankfurt	...dep.	17.34
Mullheim ...arr.	7.06	Mannheim	...arr.	18.47
Freiburg ...arr.	7.32		dep.	18.53
	dep.	Karlsruhe	...arr.	19.44
Offenburg ...arr.	8.25		dep.	19.50
	dep.	Baden-Oos	...arr.	20.12
Baden-Oos ...arr.	9.03		dep.	20.13
	dep.	Offenburg	...arr.	20.45
Karlsruhe ...arr.	9.29		dep.	20.47
	dep.	Freiburg	...arr.	21.33
Mannheim ...arr.	10.20		dep.	20.47
	dep.	Mullheim	...arr.	21.58
Frankfurt ...arr.	11.33	Basle Bad. Bhf.*arr.	22.24	

\* German Federal Railways passenger station at Basle

The twin-unit railcar set is similar to that of the "Fliegender Hamburger." As there was only one such set available, test runs were carried out with a

Class "03" steam locomotive hauling approximately 100 tons and limited to a maximum speed of 100 km. hr. The success of these runs was established, and the diesel was placed in service and the speed limit raised to 125 km. hr. There are seats for 67 second class and 26 third class passengers, with loudspeakers, individually controlled and supplied with music from a wire-recorder built into each compartment; a Mitropa buffet service; and completely new heating system throughout. A supplementary fare of DM.3 for second class and DM.2 for third class passengers is charged in addition to the usual express train supplements of the German Federal Railways.

The distance from Basle to Frankfurt is approximately 200 miles. Bridging and track suffered severe damage during the war.

## Hydraulic Feed Boring Machine

*Different types of interchangeable heads are available for various operations*

**A**N addition has been made by Kitchen & Wade Limited, Halifax, to its range of drilling and boring machines, this being the hydraulic feed machine shown in the photographs reproduced herewith.

The right-hand illustration shows a machine arranged for fine boring, with a self-contained unit head secured to the hydraulic feed main slide, and with this arrangement four interchangeable

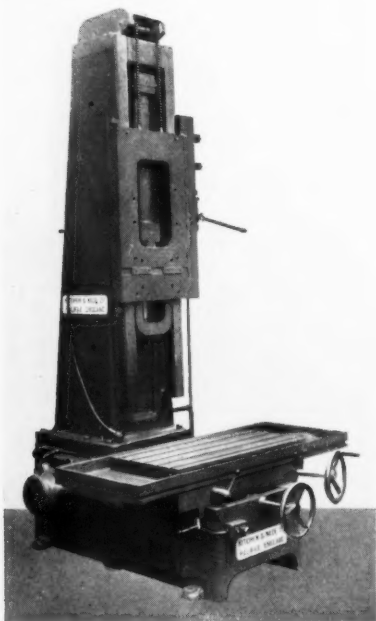
spindle snouts are available, covering a boring range of from 2½ in. to 6 in. dia. × 14 in. in length.

Each snout is a self-contained unit assembly, fitted with precision-type taper roller bearings immediately behind the cutter head, thus giving a great degree of accuracy. These bearings, moreover, are specially protected against the entry of boring dust, and have a fan fitted to each spindle in

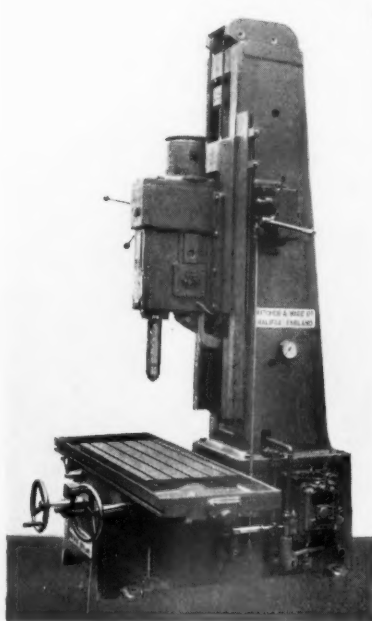
addition to the usual sealing devices. The single-point tungsten carbide tool can be pre-set by means of a built-in micrometer adjustment. Nine speeds, of from 1,440 r.p.m. to 126 r.p.m., are available with this fine boring head. Self-contained illumination of the work area is a standard feature of the machine.

The other illustration shows the basic machine, which comprises base, table, column, slide, and hydraulic feed motion. The slide, which has a 2 ft. 6 in. traverse, is coupled to the hydraulic-feed cylinder and has an automatic cycle, i.e., quick approach, feed, quick return, and stop. Adjustable dogs are fitted for the varying lengths of feed and quick traverses required. The feed range is infinitely adjustable from ½ in. to 12 in. per min. traverse.

An important feature of the new machine is the availability of different types of interchangeable heads for other operations, e.g., single and multiple spindle drilling, boring and reaming, and so on, thus making the machine versatile in character. A plain box bed-type table can be supplied as an alternative to the compound type shown.



The boring machine with the detachable head removed



The self-contained head secured to the main slide

**F.B.I. OFFICE OPENED IN TORONTO.**—To extend the scope of its representation the Federation of British Industries has opened an office in the Royal Bank Building in Toronto, with Mr. Hugh D. Scully as Canadian Adviser and Mr. J. H. C. Mahaffy as General Manager. It hopes that British groups deciding to open offices in Toronto will locate them in this building, where their representatives can readily turn to the F.B.I. officials and staff for guidance. The Federation has decided that facilities in Toronto will not be restricted to direct members.

## Fabric Cushioning for Bridge Bearings

*To take up uneven bearings and damp out vibration, fabric pads are being used between girders and masonry and between trestle-towers and pedestals*

THE Chesapeake & Ohio Railway is at present undertaking an extensive construction programme of new branch lines to open up the undeveloped coal-fields of eastern Kentucky and Western Virginia. On some of these branches bridging is heavy, and the mountainous terrain traversed by two of them has necessitated the construction of two high trestle viaducts. On all these and other new bridges, and for all bridges being rebuilt throughout the system, the railway is using fabric pads interlaid between steelwork and masonry at all points.

Though, admittedly, this form of cushion has been installed for too short a time to provide an exhaustive test of ability to stand up to heavy service for long periods, it is significant that this railway has now standardised its use, and that nearly 50 bridges have been so fitted during the past two years. It is



*Above: Arnold Fork Viaduct, Chesapeake & Ohio Railway, on which fabric pads have been interposed between steelwork and masonry*



*Left: Girder bearing on abutment of Arnold Fork Viaduct showing pad beneath masonry plate*

*Below: Fabreeka pad, 41 in. square, on tower pedestal of West Fork Viaduct, C. & O.*

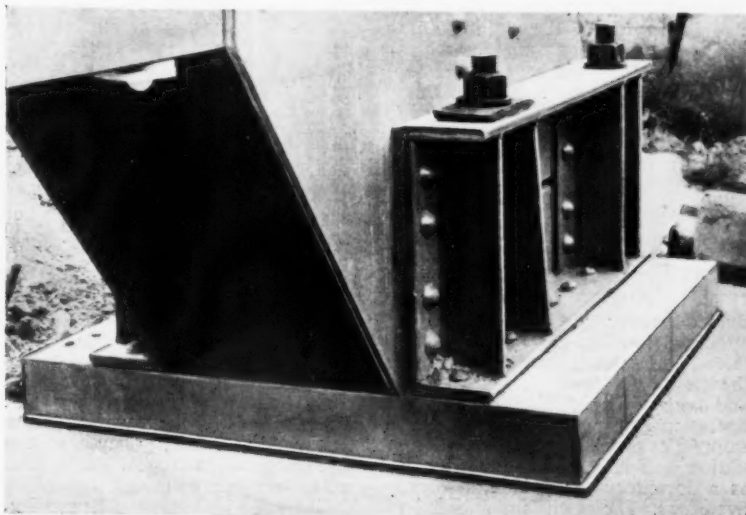
the vibration caused by passing trains and eliminate abrasion and wear between steelwork and masonry. They are used mostly between the girder bearing plates and abutments and masonry piers, but in the case of the two high viaducts already mentioned, have also been inserted between the masonry plates carrying the feet of the tower-trestles and the tops of the pedestals, on which they are founded. Here, the dead load on each pedestal is calculated to be 95 lb. per sq. in., but under a fully-loaded train this pressure is estimated to rise to 650 lb. per sq. in. The 555 lb. per sq. in. additional live loading is thus temporarily transmitted through the compressible pads to the masonry foundations.

We thank our American contemporary *Railway Engineering & Maintenance* for the above information and for the accompanying illustrations.

intended to use pads throughout the new 2½-mile viaduct to be constructed at Richmond, Virginia, in place of the old one no longer considered serviceable.

The pads used by the Chesapeake & Ohio Railway are cut from Fabreeka sheet, a material that has been extensively used for some time past for pads between sleepers and bearing plates. It consists of multiple layers of specially designed hard-woven duck, each  $\frac{5}{8}$  in. thick, impregnated with rubber solution and cured under heat and pressure. The layers are made up into  $\frac{1}{2}$ -in. sheets, for which unusual strength and a limited permanent "set" are claimed. In the track these pads absorb impact, reduce noise, and minimise mechanical wear in the sleepers and wear at the joints.

For bridgework, Fabreeka pads up to 40 and more inches square are in use. Their principal use is to distribute dead and live loads evenly over the whole bearing area. They also absorb much of





## Provincial Station Architecture in Italy

*War damaged stations fringing the Mediterranean rebuilt to harmonise with local architectural styles*

**S**IMPLICITY of design combined with straight lines but moderate streamlining are the keynotes of the architecture of almost all the reconstructed station buildings of small and medium-size towns in parts of Italy devastated by the war. Small rural station buildings formerly of cubist design have been replaced generally by spacious and attractive structures.

Subways connecting either the booking hall or the first platform with island platforms have been adopted in numerous instances, though the use of the subways is not always enforced at the smaller stations. Platform roofs, formerly lacking in most of the small station buildings, are now a general feature of the new structures.

Although the designs of the new



*Above: New station at Viareggio on the coast of Tuscany*

*Left: External view of Viareggio Station*



den with sub-tropical plants. Similar station buildings have been adopted further south on the coast line to Pisa and Rome. One is Viareggio, a fashionable seaside resort 13 miles north of Pisa, where it was possible to rehabilitate wrecked parts of the old building.

**CHLORIDE ELECTRICAL STORAGE COMPANY SUBSIDIARY.**—The manufacturing and selling activities of the Chloride Electrical Storage Co. Ltd., principally carried out under the trade names "Chloride," "Exide," "Exide-Ironclad," and "Drydex," have been transferred to a new subsidiary company, Chloride Batteries Limited, which has a capital of £1,500,000.

station buildings do not vary much, mainly because of the plain faces and straight lines adopted, there has been a tendency to introduce adaptations in conformity with the architectural style of the towns or district. Thus, in the south, preference is for arched entrance doors and arched windows instead of the straight architrave. An outstanding example is the new station building at Formia, a town of some 60,000 inhabitants, on the direct (western) Rome-Naples main line, 80 miles from Rome, and 53½ miles from Naples.

The old station building, destroyed during the war, has been replaced by a structure consisting of two two-storey lateral blocks set somewhat back from the central body which connects them and houses the booking hall and the operating services. The lateral two-storey blocks include eight flats for the station staff and their families, as well as a dormitory for train and locomotive crews. The extensions at both ends

of the building contain offices and the canteens for the staff and the personnel. The new building cost lire 92,000,000 (approximately £46,000, pre-devaluation value). Including expenditure on the restoration of the square in front of the station and the approaches, some lire 153,000,000 have been spent so far. Work in hand covers the completion of a subway between the building and an intermediate platform, and the building of a roof over that platform.

An example of the style adopted for a number of small station buildings on the Ligurian Riviera (Genoa to Spezia and Genoa to Ventimiglia) is shown in the illustration of Levante Station, 42½ miles east of Genoa Principe. These seaside stations, though of comparatively limited commercial importance, are important for the tourist traffic, particularly in summer. They have therefore been reconstructed on a liberal scale, on modern, though sober, lines. Each station building has its small gar-

**BRITISH TRANSPORT POLICE: MIDLANDS HEADQUARTERS.**—Various changes have taken place recently in the Railway Police, now known as the British Transport Commission Police, who have been organised in areas. The headquarters of the Midland Area has been transferred from London Euston to Snow Hill, Birmingham. The Chief of Police, Mr. W. E. N. Growdon, formerly Chief of Police of the Southern Railway, is already established at Snow Hill, together with Mr. J. Birch, Assistant Chief of Police, and a full office staff. The Midland area covers the London Midland Region and Western Region main lines of British Railways from the home counties to Holyhead, Liverpool, and the Lake District, and covers about 20 counties in all. Divisional headquarters are situated at Birmingham, Manchester, and Liverpool, and there is also a Special Investigation Branch in Birmingham, responsible directly to the Chief of Police, which deals with luggage thefts, mailbag robberies, and other crimes which affect the area as a whole.

## Provincial Station Architecture in Italy

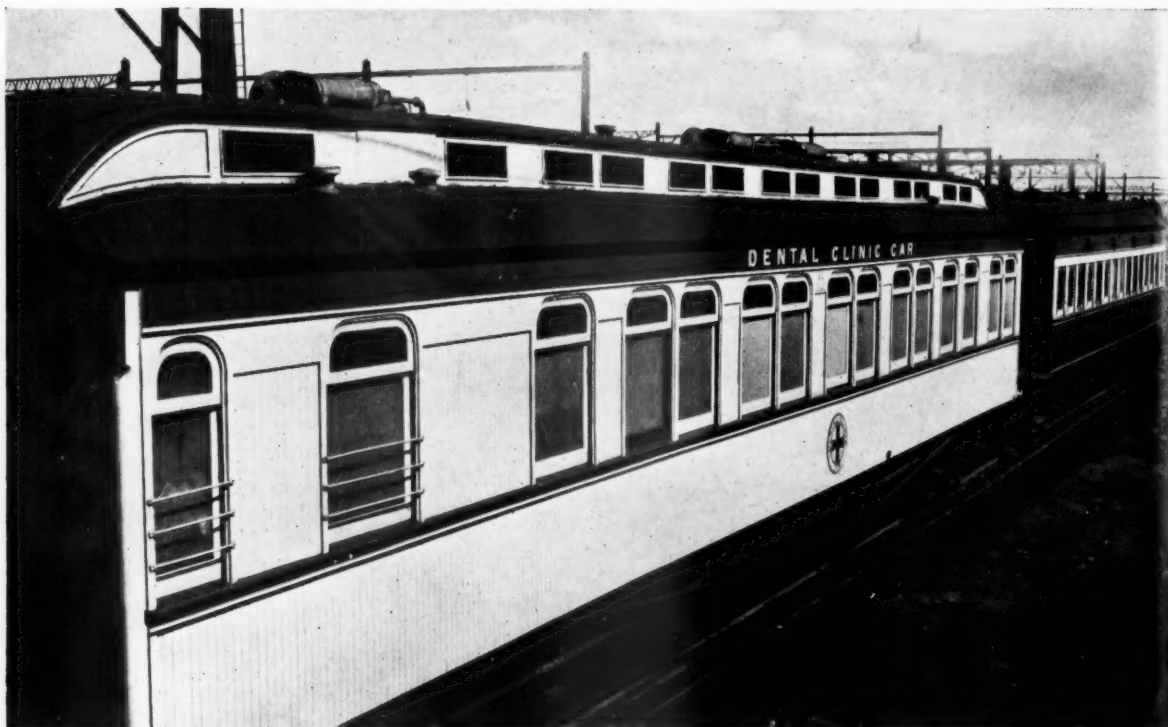


*Station at Formio, on the Rome—Naples direct main line*



*Levanto Station on the coast main line between Genoa and Spezia*

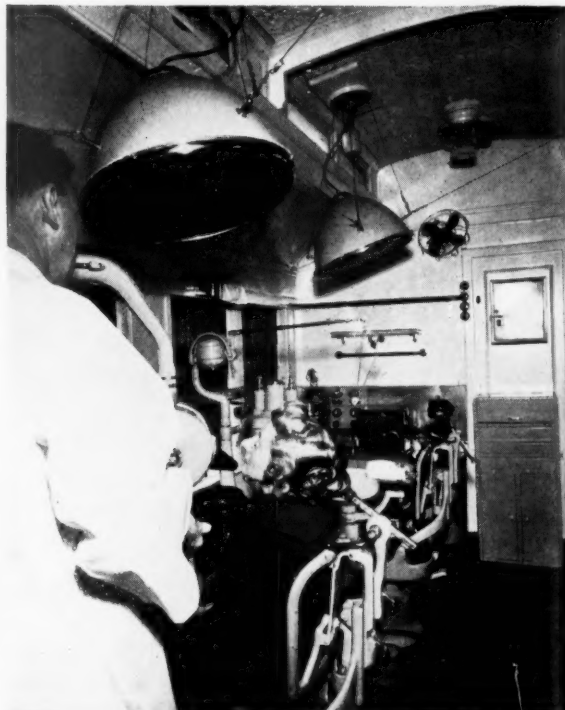
## Railway Dental Car in Australia



*One of two dental clinic cars, operated by Sydney (N.S.W.) Dental Hospital to provide treatment for patients in outlying areas who cannot travel to the hospital*



*Part of surgery, showing stainless-steel fittings*



*Patient receiving X-ray treatment*



## RAILWAY NEWS SECTION

## PERSONAL

The Minister of Transport has re-appointed Mr. E. S. Shrapnell-Smith to be a Member of the Appeal Tribunal constituted by section 15 of the Road & Rail Traffic Act, 1933, for a further term. Mr. Shrapnell-Smith has been a Member of the Tribunal since it was constituted in 1934.

Lord Rusholme, who is a Member of the British Transport Commission, has been elected a Director of Thos. Cook & Son Ltd. and associated companies.

We regret to record the death, in his 89th year, of Mr. John Leslie, who retired in 1932 as Vice-President & Treasurer of the Canadian Pacific Railway.

Mr. Robert Iglesias, General Manager of the General Mitre (former Central Argentine) Railway, has been appointed Under-Secretary for the Merchant Marine in the Argentine Ministry of Transport.

We regret to record the death on December 25 of Mr. Alexander William Sutherland Graeme, sometime Chief Mechanical Engineer, Federated Malay States Railways.

Mr. C. E. Jefferson, General Traffic Manager of the Canadian Pacific Railway since February, 1948, has been appointed Vice-President (Traffic), succeeding Mr. G. A. MacNamara, who relinquishes that post on his election as President of the Minneapolis, St. Paul & Sault Ste. Marie Railroad.

Mr. J. N. Das, Divisional Superintendent, Howrah, East Indian Railway, has been appointed Chief Commercial Manager.

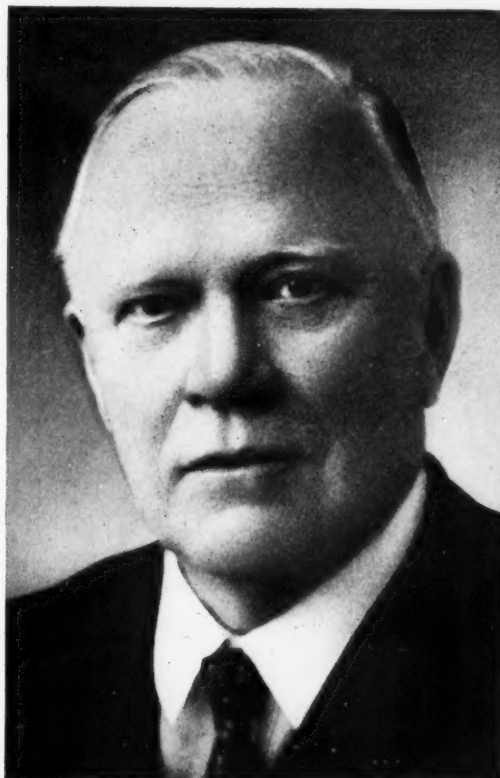
## EAST AFRICAN RAILWAYS &amp; HARBOURS

The following promotions are announced in the Chief Accountant's Department of the East African Railways & Harbours: Mr. J. T. Ferguson to be Expenditure Accountant; Mr. A. Y. McConnell to be Revenue Accountant; Mr. R. A. Duncan to be Senior Accountant; Mr. E. C. H. Davidson and Mr. T. F. Bell to be Assistant Accountants.

Mr. Basil Smallpeice, Director of Costs & Statistics, British Transport Commission, during the last eighteen months, has been appointed Financial Comptroller to the British Overseas Airways Corporation, and will take up his new duties shortly. The Director of Accounts of the British Transport Commission, Mr. H. E. Osborn, will then assume the responsibilities of the Director of Costs & Statistics, and the two posts will be amalgamated under the title of Director of Accounts & Budgets. The new division will be strengthened by the transfer of Mr. A. W. Tait from the Western Region of British Railways in the capacity of Principal Costs Officer.

Sir Montague John Eddy, C.B.E., whose death at the age of 68 we recorded briefly last week, was for many years a prominent figure in the administration of the British-owned railways in Argentina. Sir Montague Eddy, who held, among other offices, the Chairmanship of the Buenos Ayres Great Southern Railway Co. Ltd. and of the Buenos Ayres Western Railway Limited, played a leading part in the recent negotiations for the acquisition by

became Acting General Manager. He was confirmed as General Manager in 1919, and retired from that position in 1930, when he joined the boards of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, becoming Chairman of both companies in 1941. Sir Montague Eddy was also a Director of the Buenos Ayres & Pacific Railway Co. Ltd., Central Argentine Railway Limited, Bank of London & South America Limited and many other companies. During the recent war he did valuable work in the organisation of parcels for British prisoners-of-war, and went on a mission to Lisbon in that connection; and in 1945 he was appointed a member of the executive of the British Council. During his service in Argentina he played an important part in public affairs, and was for several years President of the British Society in the Argentine Republic. He was made a C.B.E. in 1926, and was knighted in 1944. A memorial service for Sir Montague Eddy is being held today (January 6) at 11.30 a.m. at St. Margaret's Lothbury, E.C.2.



*The late Sir Montague Eddy*

Chairman of the B.A. Great Southern and Western Railways from 1941, and for many years a leading figure in Anglo-Argentine railway circles

the Government of Argentina of the British-owned railways there (to which further reference is made in an editorial article elsewhere in this issue). He was born in 1881, and, like his father, the late Mr. E. M. G. Eddy (who afterwards became the first Commissioner of Railways for New South Wales), commenced his career on the L.N.W.R. His brother, Mr. Alexander Eddy, who retired in 1945 as Chief Legal Adviser & Solicitor to the L.M.S.R., also began his career on the same railway. Montague Eddy joined the L.N.W.R. in 1898, and, after a course of training, became Assistant Traffic Superintendent, Lancaster Division. In 1904 he was appointed Assistant Rolling Stock Superintendent, in 1911 was promoted Rolling Stock Superintendent, and in the next year became Mineral Traffic Manager. In 1915 he left the L.N.W.R. on being appointed Assistant General Manager of the Buenos Ayres Great Southern Railway, of which shortly afterwards he

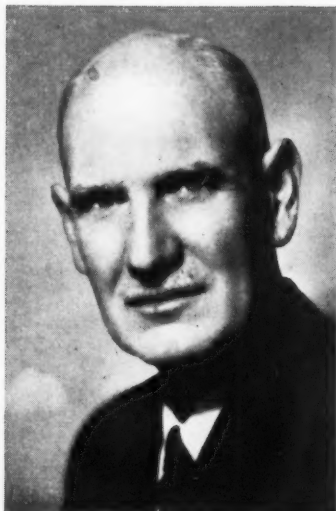
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SIR MONTAGUE EDDY—  
AN APPRECIATION

The following appreciation was contributed by Lord Davidson to a recent issue of *The Times*:—

The passing of Monty Eddy has robbed many of us of a good companion and a generous friend. My memories start with the first peacetime voyage of the re-conditioned R.M.S. *Almanzora*, carrying a full complement of passengers returning to Argentina after the first world war. The Eddys were the life and soul of the party. Then as the years passed there came a much closer association and friendship, in particular when, as Monty Eddy's Deputy Chairman on the board of the B.A. Great Southern, I was able to appreciate his gifts in administration and negotiation. His charm was perpetual youth, he never really grew up. If sometimes he appeared to be impetuous, it was the gay impetuosity of youth, which made everyone love him, especially on the railways in Argentina, because they all knew that he was genuinely seeking to advance their interests—Argentine and British alike.

Before the war it became apparent that the British-owned railways in Argentina were bound soon to pass into Argentine ownership. Eddy's monument is enshrined in the agreement of sale, with which his name will always be associated. If there have been failures and injustices, it is by subsequent interpretation and application of the agreement, not because of any lack of spirit or intention on his part. Up to the day of his death Eddy was pre-occupied with securing justice for the loyal and expert employees who have been responsible for giving Argentina the finest railway system in South America. The sympathy of his countless friends will go out to his widow and family in their grievous loss, which we all share.



**Brigadier James Storar**

Appointed Vice-Chairman of the Vulcan Foundry Limited



**Mr. H. H. Andrews**

Adviser to Traction Department, The English Electric Co. Ltd., who has retired



**Mr. C. C. H. Wade**

Manager of Traction Sales & Contracts, The English Electric Co. Ltd.

Brigadier James Storar, C.B.E., M.I.Mech.E., a Director of the Vulcan Foundry Limited, has been appointed Vice-Chairman. He is also a Director of Robert Stephenson & Hawthorns Limited; Antofagasta (Chili) & Bolivia Railway Co. Ltd. and its subsidiaries; Great Western of Brazil Railway Co. Ltd.; Dorada Railway Co. Ltd.; La Guaira & Caracas Railway Co. Ltd.; Nyasaland Railways Limited; Central Africa Railway Co. Ltd.; and the Trans-Zambesia Railway Co. Ltd. He received his early training in locomotive engineering with Robert Stephenson at Darlington. After serving in the 1914-18 war as a company commander in the Northumberland Fusiliers, and later in the Railway Operating Division, R.E., he was

appointed in 1919 as a District Locomotive Superintendent on the Rhodesia Railways. In 1923 he was appointed Chief Mechanical Engineer of the Nyasaland and Trans-Zambesia Railways in charge of rolling stock and steamship services, and during the absence of the General Manager acted in his stead. He rejoined the Army in the recent war as a Lt.-Colonel (O.M.E. 1st Class), and in 1941 was promoted Colonel. In 1942 he was transferred to the War Office as an Assistant Director of Mechanical Engineering, and in 1943 was appointed a Deputy-Director, as Brigadier. Since his release from the Army in 1946 he has paid business visits to Egypt, South Africa, Rhodesia, Nyasaland, Brazil, Peru, Chile, Bolivia, Argentina and U.S.A.

Mr. H. H. Andrews, who retired on December 31 from the position of Adviser to the Traction Department of The English Electric Co. Ltd., was born in 1884, and was educated at University College School and University College, London. In 1902 he became a pupil at the Hampstead Corporation Power Station, and in 1903 he joined the outside erection staff of the then British Westinghouse Electric & Manufacturing Co. Ltd. From 1912-13 he was engaged in traction survey work for a private mining enterprise in Turkey, and in 1914 he joined the Army, serving throughout the war. At the time of his demobilisation, in 1919, he was a Captain in the 2/5 Lancashire Fusiliers. In that year he joined The English Electric Co. Ltd., and from 1926 to 1936 was Manager of Traction Tendering & Contracts for that company, first at Preston and then at Bradford. From 1936 to 1943 Mr. Andrews was Assistant Manager, Traction Department, London, and in the latter year he was made Manager of Traction Sales & Contracts. He was appointed Adviser to the Traction Department early last year.

#### Presentation to Mr. G. L. Darbyshire



*Mr. G. Royde Smith (right), lately Secretary of the L.M.S.R., making a presentation at Euston recently to Mr. G. L. Darbyshire, Chief Regional Officer, London Midland Region, British Railways, who retired on December 31*

Mr. C. C. H. Wade, Manager of Traction Sales & Contracts for The English Electric Co. Ltd., became a student-apprentice with that company at Preston in 1922, after having obtained a diploma in electrical engineering and applied physics at the City & Guilds (Finsbury) Engineering College. In 1924 he became Assistant Resident Engineer for The English Electric Company on the construction of rotary-converter substations for the Southern Railway. From 1925 to 1935 he carried out various duties in the Traction Department of The English Electric Company, and from 1935 to 1938 was Resident Engineer for that company on the electrification of railways in Poland. Mr. Wade subsequently received the following appointments with The English Electric Company:—Chief Traction Projects Engineer (1938); Works Superintendent, Plant & Transformer Works, Stafford (1940); Works Manager, Plant & Transformer Works, Stafford (1943); and Deputy Manager, Traction Department (1945). Since 1948 he has been Manager of Traction Sales & Contracts.

**The New Year Honours List**

The following is a selection of honours of transport and industrial interest from the New Year list:—

**Barons**

Sir (Alexander) Steven Bilsland, Bt., M.C., LL.D., for public services in Scotland; sometime a member of the L.M.S.R. Scottish Committee.

Mr. Thomas William Burden, C.B.E., J.P., M.P. for the Park Division of Sheffield since 1942; Second Church Estates Commissioner since 1945; for political and public services; a former member of the National Executive of the Railway Clerks' Association.

Mr. Joseph Henderson, J.P., M.P. for the Ardwick Division of Manchester, June-October, 1931, and since 1935; a Lord Commissioner of H.M. Treasury since 1945; President, National Union of Railwaymen, 1933-36.

The Rt. Hon. John Wilmot, M.P. for East Fulham, 1931-35, for Kennington, 1935-45, and for Deptford since 1945; Minister of Supply, 1945-47; for political and public services.

**Knights Bachelor**

Mr. Cuthbert Barwick Clegg, Vice-President, British Employers' Confederation.

Mr. Harold Vincent Tewson, C.B.E., M.C., General Secretary, Trades Union Congress.

**G.C.B. (Military Division)**

Field-Marshal Sir William Joseph Slim, G.B.E., K.C.B., D.S.O., M.C.; sometime Deputy-Chairman, Railway Executive.

**C.B. (Civil Division)**

Mr. William Graham, M.B.E., Under-Secretary, Ministry of Transport.

**G.B.E. (Civil Division)**

Sir (Arthur) Malcolm Trustram Eve, Bt., M.C., T.D., K.C., lately Chairman, Central Land Board and War Damage Commission.

**C.B.E. (Civil Division)**

Mr. Donald McIntyre Sinclair, M.I.Mech.E., M.Inst.T., General Manager, Birmingham & Midland Motor Omnibus Co. Ltd.

**O.B.E. (Civil Division)**

Mr. Frederick James Carr, J.P., Member, Licensing Authority for Public Service Vehicles, Northern Traffic Area.

Mr. Francis John Chapple, D.S.O., M.B.E., M.Inst.T., Director & General Manager, Bristol Tramways & Carriage Co. Ltd.

Mr. Arthur William Hoyer Keen, A.M.I.E.E., Deputy Chief Mechanical Engineer to the Crown Agents for the Colonies.

Mr. Leopold Leighton, M.I.C.E., M.I.Mech.E., lately Engineer-in-Chief, Mersey Docks & Harbour Board.

Mr. James Stuart McNeillie, of Southern Rhodesia; formerly President, Rhodesia Railways Workers' Union.

Mr. James George Pearce, M.Sc., M.I.Mech.E., M.I.E.E., F.Inst.P., Director of the British Cast Iron Research Association.

Mr. Thomas Buchan Stewart, British subject resident in Argentina; lately Commercial Superintendent, Buenos Ayres Great Southern and Buenos Ayres Western Railways.

Mr. Frederick Weller, Chief Officer (Administration), Commercial Department, Railway Executive.

**M.B.E. (Civil Division)**

Mr. William Fitzgerald Beatty, A.M.I.C.E., Assistant District Engineer,

Watford, London Midland Region, British Railways.

Mr. Alfred Haselden, General Works Manager, Ford Motor Co. Ltd., Dagenham.

Mr. Kenneth Bernard Ling, Superintendent, Standard Telephones & Cables Limited, Treforest.

Mr. Charles Samuel Sayce, Assistant Stores Superintendent, East African Railways & Harbours.

Mr. John Emanuel Arthur Shearing, Divisional Police Superintendent, Railway Executive.

Mr. Tom Wadsworth, Chief Inspector, Calder & Hebble Section, North Eastern Region, Docks & Inland Waterways Executive.

Mr. Geoffrey William Warren, Physicist, Research Laboratories, General Electric Co. Ltd.

Mr. Thomas Haydn Williams, Mill Manager & Chief Roll Designer, Cargo Fleet Iron Co. Ltd., Middlesbrough.

We regret to record the death on December 27, in his 76th year, of Mr. Walter Duckitt, founder, and Chairman, of the Moss Gear Co. Ltd.

Mr. C. Tuson has retired, because of ill-health, from the board of Keith Blackman Limited. The two vacancies on the board caused by Mr. Tuson's retirement and the recent death of Mr. C. J. A. Galloway, have been filled, respectively, by the election as directors of Mr. G. S. Teggin, Chief of the Contracts Department, and Mr. W. G. Calder, Manager of the company's Arbroath Works.

We regret to record the death of Mr. Sydney Couper, sometime General Manager of the Uganda Railway. Mr. Couper was born in Glasgow in 1873, and his early railway career was spent in the Engineering Department of the London & North Western Railway. He joined the construction staff of the Uganda Railway in 1897 as an Assistant Engineer, and was promoted District Engineer in 1906. In 1913 he was appointed Director of the Jamaica Government Railway, and in November, 1918, he returned to East Africa to become General Manager of the Uganda Railway. He resigned that appointment in 1922, and thereafter had lived in retirement in England.

**LUNCHEON TO MR. JOHN ELLIOT**

Shortly before leaving the Southern Region to take up his appointment as Chief Regional Officer of the London Midland Region, Mr. John Elliot visited Southampton for a farewell luncheon, at which the Docks & Marine Manager, Mr. R. P. Biddle, referred to the high regard in which Mr. Elliot was held by the staff of the Docks and Marine Departments. For a great many years, he said, they had appreciated the keen interest Mr. Elliot had always shown in Southampton Docks, the cross-Channel services and the whole of the staff ashore and afloat. He asked Mr. Elliot to accept farewell gifts as a token of their esteem. Mr. Biddle also said that they welcomed his successor as Chief Regional Officer, Mr. C. P. Hopkins, who would receive the utmost support from the Docks and Marine Departments. After other tributes had been paid, Mr. Elliot thanked Mr. Biddle and his staff for their loyal co-operation, congratulating them on their organisation; in his opinion, they had an *esprit de corps* which was second to none. Mr. Hopkins also returned thanks for the welcome accorded him, stating how pleased he was at his reception into such a happy and efficient family circle.

We regret to record the death, at the age of 68, of Mr. John O'Dowd, who retired in 1942 from the position of Traffic Manager, Great Southern Railways, Eire. Mr. O'Dowd acted for many years as a correspondent of *The Railway Gazette*.

Mr. D. Woodman has been appointed Chief Clerk (Staff & Administration) to the Public Relations & Publicity Officer, London Midland Region, British Railways. He had latterly been engaged in Trade Advertising activities until the incorporation of that work in the Public Relations & Publicity Department early last year.

The Federation of British Industries has opened an office in Toronto in order to extend the scope of F.B.I. representation in Canada. Mr. Hugh D. Scully, formerly Canadian Consul-General in New York, will be Canadian adviser to the F.B.I. at the Toronto office, and Mr. J. H. C. Mahaffy, formerly Executive Vice-President, Commodity Prices Stabilisation Corporation, Ottawa, will be General Manager.

Mr. H. A. Massey, District Operating Superintendent, Cork, Coras Iompair Eireann, has been appointed District Superintendent, with responsibility for control of all rail and road freight operations of the company in the Cork area. Two Assistant District Superintendents have also been appointed, responsible to Mr. Massey for the sections under their control:—Mr. P. J. Herbert, with charge of all railway commercial matters, and Mr. L. J. Power, responsible for road freight services.

Mr. K. Baumann has retired from the board of the Metropolitan-Vickers Electrical Co. Ltd., and from his position as Chief Mechanical Engineer to the company. He is succeeded in those appointments by Mr. Norman Elce. Mr. Baumann joined the company in 1909 as turbine engineer, and in the next year was appointed Chief Engineer, Engine Department. In 1912 he was made Chief Mechanical Engineer. He joined the management committee in 1920, in 1927 was appointed a Special Director and member of the executive management board, and in 1931 was elected a Director. From July, 1947, he was Chairman of the A.E.I. Engineering Committee. Mr. Baumann has presented many notable papers, dealing mainly with turbine practice. In 1948 he was invited by the Institution of Mechanical Engineers to deliver the Thomas Hawksley Lecture, and selected as his subject "Heat Engines"; and a few months ago he was awarded the 1948 James Clayton Prize by the council of the Institution for his contribution to the advancement of mechanical engineering science by way of invention, design and investigation. Mr. Elce went to Metropolitan-Vickers as a college apprentice in 1920. From 1926 until 1941 he was responsible for the company's industrial turbine applications and for many noteworthy turbine installations; towards the end of that period he was also responsible for work on marine turbines. In the recent war the company formed a section for special work (under the D.S.I.R.) in connection with the military use of atomic energy, and in that connection Mr. Elce visited the United States as a member of the British team under Sir Wallace Akers. In 1944 he was appointed Assistant to the Chief Mechanical Engineer, and in 1948 became Assistant Chief Mechanical Engineer. Recently he has again visited the U.S.A., and has been to Finland, U.S.S.R., Egypt, Germany and Switzerland.



## Canadian Pacific Railway: Presidential Review of 1949

*Heavy traffics were handled, and, although strict economy has had to be enjoined because of inadequate rates, notable progress has been made in motive power and other directions*

In his annual year-end statement, Mr. W. A. Mather, President of the Canadian Pacific Railway, says that during 1949 the Canadian Pacific again experienced a year of comparatively heavy traffic, and tonnage handled decreased only slightly from the records established in the earlier post-war years. Fortunately for the Canadian railways and the national economy, no severe dislocations to industry such as those which beset the United States were sustained. Consequently, although in some categories wagon loadings were down and there was a marked falling-off in extremely long haul traffic which characterised the war years when supplies and equipment from all parts of the country were concentrated on the eastern seaboard, there was a continuation of the increase in production and wagon loadings which contributed to and are a result of Canadian industrial expansion.

It continues to be disappointing that with such buoyant traffic, the ratio of net earnings to gross earnings remains at the lowest level in the company's history. Faced with this situation, the Canadian Pacific has had to continue to practise the strictest economy in its operations to meet its immediate financial obligations. It has been able to undertake some notable improvements consistent with the ability to pay for them.

Although its equipment situation is not all that might be desired, because of inadequate financial returns and the high cost of replacements, it has begun an extensive programme of dieselisation of motive power, which, it is expected, will produce substantial savings in transport costs, although the amount necessary to purchase the new equipment represents a heavy outlay which could not be justified except in terms of those savings.

The Esquimalt & Nanaimo Railway, on Vancouver Island, is now totally served by diesel locomotives, and late in 1949 the Canadian Pacific completed dieselisation of the 171-mile section between Montreal and Wells River, Vermont, by the acquisition of three 2,250-h.p. diesel locomotives. This order followed delivery, earlier in the year, of 20 other diesel units for this section of the company's lines, including 1,500-h.p. freight locomotives and shunters of the same capacity and some 1,000-h.p. diesel shunters of a type now widely dispersed over terminals of the Canadian Pacific.

The next large step to be taken in the expanding dieselisation project is indicated in orders recently placed with newly-established Canadian manufacturers for 58 diesel locomotive units to be assigned to 517 miles of the main line on the Schreiber division. Fulfilment of these orders will bring to 190 the number of diesel locomotives operated by the Canadian Pacific in Canada.

Apart from the acquisition of diesels, the oil discoveries in Alberta and Saskatchewan have provided a major new source of fuel, and the company's Weston Shops at Winnipeg have been working on orders to convert more than 100 steam locomotives used on the prairies from coal to oil-burning.

In July, Canadian Pacific Air Lines inaugurated service from Vancouver, by way of Honolulu, Canton Island, and the Fiji Islands, to Australia, and in Septem-

ber it added a weekly service linking Vancouver with Tokyo and Hong Kong.

Additional air services opened up by Canadian Pacific Air Lines in 1949 were from Montreal to the north-western Quebec mining communities of Val d'Or and Rouyn-Noranda, and from Winnipeg to the Hudson's Bay port of Churchill.

Operations of Canadian Pacific Steamships on the North Atlantic proved satisfactory, with its fleet of nine ships, two Empresses, four fast Beaver cargo ships, two Beaver cargo-passenger ships and the immigrant ship *Beaverbrae*, carrying more freight and passengers in and out of Montreal than in any summer season since the war. Next May the Canadian Pacific will be able to provide a weekly service by Empress liners on the St. Lawrence route to the United Kingdom.

Two new 6,000-ton Clyde built passenger vessels have joined the company's British Columbia Coast Service fleet in the last year. The *Princess Marguerite* and the *Princess Patricia* both arrived via the Panama Canal early in the year and are now engaged in the popular "Triangle Run" service between Vancouver, Victoria, and Seattle. Both can carry 2,000 passengers a trip. Another ship, a 6,000-ton car ferry destined for service between Vancouver and Nanaimo, on Vancouver Island, where the C.P.R. last sum-

mer opened a new \$1,700,000 ship terminal, has been ordered.

Work is progressing steadily on the \$9,500,000 hump retarder yard in Montreal, due for completion in 1950 and to be the most modern yard in Canada. It will be one of the first in North America to use a new system of "push-button" switching, by which it will be possible to set all the points necessary to move a wagon into a certain track merely by pushing buttons in a control tower.

In passenger equipment, the Canadian Pacific Railway put into service the first roomette-type sleeping cars seen in Canada. Five of the ten-roomette, five double-bedroom cars have gone into main-line service. Fourteen more are on order, as well as 64 first class, air-conditioned day coaches, also for main-line operation.

It is plain that such improvements can continue only if the Canadian Pacific is permitted revenues sufficient to play its full part in the development of the nation. Its situation in this respect is made clear in the extensive submission filed with the Royal Commission on Transportation which is now hearing evidence on all aspects of transport within Canada.

In Canadian trade, at home and abroad, the Canadian Pacific plays an integral part, after seven decades of steady and healthy development. The Canadian Pacific is proud of that part, and of Canada's remarkable growth. It is its hope that conditions will permit it to carry on as always, providing the efficient, low-cost transport without which no nation of such great distances may achieve full stature.

## Canadian National Railways' Operations in 1949

*Mr. Vaughan, in his last presidential review before retirement, draws attention to the dwindling operating surplus, despite record revenues, due to mounting costs and heavy fixed charges*

It is estimated that the gross revenues of the Canadian National Railways for the past twelve months will establish a record high total of \$499,000,000, an increase of \$8,000,000 over 1948, states Mr. R. C. Vaughan, former Chairman & President of the company in his review of 1949. The shrinking margin between revenues and expenses, however, continues to cause considerable anxiety. Operating expenses, with higher labour costs and an increased general price index for materials and supplies, climbed to \$480,000,000, an increase of \$15,000,000 over 1948.

The operating surplus of approximately \$19,000,000 will be the lowest since 1938, and after provision for interest due on securities held by the public and owing to the government, payment of taxes, equipment rents and similar charges, the year will end with an income deficit estimated at \$45,000,000.

These high gross revenues demonstrate again the great earning power of the Canadian National Railways and its importance in the national economy. On the other hand, the excessive absorption of revenues by operating expenses, and the burden of fixed charges are a constant cause of worry to the management.

Fixed charges against the system are top heavy because it has had to assume, without mitigation, the debts of bankrupt predecessor companies. In all fairness, states Mr. Vaughan, recognition should be made of the inclusion in C.N.R. operat-

ing expenses of the costs of non-paying public services, and steps taken to relieve the railway of the burden created by them.

The Canadian National has recommended to the Royal Commission on Transportation that the national transportation policy, of which the formulation has been entrusted to the Commission, should cover all forms of transport, so that each may perform the function for which it is best adapted. Jurisdiction should be assigned to a central regulatory body.

Final figures for the year 1949 are expected to show that the Canadian National Railways moved 77,000,000 revenue tons of freight, 10 per cent. less than in 1948, and approximately 19,000,000 revenue passengers, a decrease of 1,000,000.

Inadequate relief from the continuous rise in operating costs was obtained during the year by the granting of higher rates both in freight and passenger services. The mounting income deficits reported by the system in the past three years indicate that revenues from this source were inadequate.

The general price index showed an increase of 3.3 per cent. over 1948. Higher rates of pay to staff increased payroll costs by \$5,500,000. No serious or extended rolling stock shortage was experienced. The use of diesel power was extended, and the post-war programme of converting and remodelling sleeping, bedroom, buffet and lounge cars is proceeding.

With the union of Newfoundland and

## The Leopoldina Railway Co. Ltd.

Canada on April 1, 1949, the Canadian National Railways were entrusted with the control of the railway, steamship and dock services, telegraph and telephone facilities. This has added some 700 miles of operated track to the company's railways, and a fleet of 19 ships; an additional 4,000 employees were transferred to Canadian National payrolls. A substantial reduction was made in freight and passenger rates on the island and C.N.R. standards of rates of pay and working conditions were extended to the new district. In December, the operation of the Temiscouata Railway in Quebec and New Brunswick, was entrusted to the Canadian National.

An unfortunate and costly interruption in services operated by the Canadian National West Indies Steamships occurred last March, due to a strike by the Canadian Seamen's Union, but by the end of the year thirty-one sailings were completed to Nassau and Jamaica, and twenty-nine sailings to British Guiana, the eastern group of West Indies colonies and Bermuda.

The development of new and extensive oilfields in Alberta has prompted the railway to extend the use of oil as fuel for its locomotives and a programme is under way for the conversion to oil burning of coal-burning engines. Rapid progress is being made in the construction of modern freight warehouses and the freight-handling facilities at Bonaventure, Montreal, to replace those destroyed by fire in 1948. New research and testing laboratories at Montreal have been brought into full operation. They are designed primarily to evaluate the merits and qualities of the materials and supplies bought by the railway, to discover new products, and check specifications for the requirements of the system.

Negotiations have been concluded with the civic authorities covering the building of a new wing to the Macdonald Hotel, Edmonton. Suggestions from the staff for reducing costs and improving service averaged more than one hundred a week.

On December 31, after 51 years of railway service, Mr. Vaughan relinquished his duties as Chairman & President. He said: "I have been privileged to see and to participate in the tremendous progress made in the realm of railway transportation. It remains the most economical form of transport, if all the factors are taken into consideration, and I hold firmly to the conviction that the prosperity of Canada depends in large measure on the well-being of her railways. The Canadian National, a development railway, has provided that modern transport service so essential to Canada, and under the leadership of Mr. Donald Gordon, its new Chairman & President, I believe it will long continue to serve our nation dependably and efficiently."

**INCREASED FREIGHT RATES TO TRINIDAD.**—From February 1 an increase of about 10 per cent. will be applied to freight rates from the United Kingdom, Scandinavia, and near-Continent, to Barbados, Trinidad, Windward and Leeward Islands, and ports served by transshipment via Trinidad. An exception is the *ad valorem* rate charged on goods valued at £300 per freight ton, which will not be affected. There will be no increase in landing charges. Devaluation of sterling is largely responsible for the advance of rates on this as on other routes, to meet the increased cost of oil fuel and port charges.

The annual general meeting of the Leopoldina Railway Co. Ltd. was held at Beaver Hall, Garlick Hill, Cannon Street, London, E.C.4, on December 29. Mr. C. H. Pearson, the Chairman, presiding.

The Chairman said that in view of the radical change in the company's situation since the end of the year 1948, he did not propose to occupy much time in reviewing the accounts of that year. Once again an operating loss was recorded—£790,000, as against £130,000 in 1947. Adding debenture interest and other London charges the total loss for the year was nearly £1,200,000, a result which obviously reflected a situation of the utmost gravity. The immediate and preponderant reason for this deterioration in the position was the reduction of over £500,000 in traffic receipts, to which several factors contributed.

Yet though the immediate cause of the increased working loss must be attributed to a reduction in receipts, on the other hand diminished receipts had to be set against working expenditure which, although exercised with all practicable economy, over the last few years had been inflated almost beyond measure.

Increases in the price of materials, especially fuel, had played their part, but the wage bill, above all else, had contributed to this result directly attributable to rises in rates of pay as a consequence of continuous inflationary pressure. Thus in 1948 staff costs accounted for nearly 60 per cent. of total operating expenditure.

In this actual year, 1949, by decision of the Government, further general increases in wage levels had had to be conceded, statutory contributions to the employees' pension fund raised, and obligatory payment for rest days and holidays enforced. The effect had been practically to double the pre-existing payroll and correlated costs, adding an estimated additional 140 million cruzeiros annually to expenses, or, say, £1,870,000 at the old exchange rate of Cr. \$75 to the £. The concession of this new wage increase was only made possible by the Brazilian Government's agreeing to subsidise its cost. Current expenditure of staff now comprised about three quarters of total working costs and in itself exceeded gross traffic revenue.

Last year they had been told of the visit paid to Brazil by Lord Hawke, Major Baring, and the secretary, in the early part of 1948, in response to an invitation of the Brazilian Government to discuss the future of the railway; at the time of the annual general meeting last year, they had no knowledge of the action the Brazilian Government intended to take.

Not until the middle of January, 1949, was news received that Dr. José Vieira Machado was on his way to London, as the representative of the Brazilian Government to treat with them regarding the future régime of the railway. An announcement was made to the Press in May last at the time of signature of the agreement and the information then given was summarised in the report.

The agreement was an "ad referendum" agreement: ad referendum to the National Congress of Brazil; ad referendum to them and all other classes of stockholders in the railway. It only became binding when ratified by both sides, they themselves proceeding by means of a scheme of arrangement, under Section 206 of the Companies Act, 1948.

As explained in the directors' report various matters had combined to delay

completion of the scheme, but the time was now approaching when it could be brought to completion and submitted to them for approval. One of the parties to the scheme would necessarily be the holders of the 5 per cent. debentures of the Leopoldina Terminal Co. Ltd., which were guaranteed as to principal and interest by their company. The assets of the Terminal Company, namely, their interests in the Cantareira Company, were entirely outside and unaffected by the agreement entered into by the Railway Company.

Their conversations with Dr. Machado took place over a period of nearly four months, from February to May of that year. Through them all they were conducted on both sides in a spirit of cordiality and understanding and of complete frankness. This spirit of fair play and fair dealing sprang on the part of Dr. Machado from a deep-seated wish on the part of his Government to arrive at a fair and reasonable settlement. This was also the desire of the board and he hoped that, when the time came to submit a scheme for their consideration, they would feel this objective was attained.

In the message to Congress signed by the President of the Republic of Brazil and accompanying the Project of Law, a passage appeared which read in translation as followed:—

"It is necessary at once to point out that the position of the Leopoldina is not unique; it is the result of internal and external factors which have in general affected in diverse manner all railway activities in Brazil."

There were other references in the President's message and in the accompanying report of the Minister of Transport, which made clear that, in the view of the Brazilian Government, the company's difficulties could not by any means be attributed to causes within the company's control.

Under one of the terms of the agreement as from May 1 of this year the railway had been operated for account of the Brazilian Government; their's the receipts, their's the expenditure. This arrangement only held good provided the sale agreement was in due course ratified on the part of the company. In these circumstances, as was but right and proper, the company agreed to create the new post of "Administrador Geral," or General Administrator, and appointed thereto the nominee of the Brazilian Government, Dr. José Carlos de Moraes Sarmiento.

The report and accounts were adopted and the retiring directors, Major T. E. Baring, Sir James Milne, and Mr. C. H. Pearson, re-elected.

**TOURING BRITAIN BY COACH.**—The Travel Association (Tourist Division of the British Tourist & Holidays Board) has issued an illustrated booklet for overseas visitors with information on coach services. This booklet deals with every aspect of coach touring from a day trip to the coast to a three-week coach cruise. A survey of principal travel agencies in America and Canada shows that all-in coach cruising is growing in popularity. Copies of the booklet have been sent to the Travel Association offices in New York and Toronto to meet the demand for information for the 1950 season, and also to travel agents, shipping and air line companies, consulates, and so on.

## Sir Eustace Missenden's New Year Message

"Now is the time when we must prove that the spirit which prevails is the spirit of service and progress." This extract is from a New Year message to the 635,000 staff of British Railways by Sir Eustace Missenden, Chairman of the Railway Executive, which appears in the first issue of the *British Railways Magazine*.

Of the magazine Sir Eustace says: "It is to be essentially a staff magazine; therefore, each of the Regions has its own edition, containing a good proportion of Regional news . . . but we have to think in terms of British Railways as a whole. If we are to achieve our aim of providing Great Britain with the finest railway service in the world, we must all work together."

The arrangements provide for two Regions, Scottish and North Eastern, having their own edition of a magazine for the first time. In addition to news domestic for each Region, the *British Railways Magazine* will contain general information in which all railway men and women are interested, and will deal with problems relating to the unification of the railways.

"The problems which confront us," says Sir Eustace Missenden, "have a moral as well as a material aspect, and whichever way we look at it, from a material or moral standpoint, it comes back in the end to the individual. What you or I do, or what we fail to do, affects profoundly the sum total of our efforts."

The message ends by wishing success to the staff magazine and with the words: "to each and every one of you I send a sincere New Year's greeting and my best wishes."

## Staff & Labour Matters

### T.U.C. Wages Policy

The National Union of Mineworkers at their delegate conference in London on December 29 gave support to the policy of the T.U.C. General Council on wages restraint. The resolution will now go as a recommendation to the N.U.M. districts to be voted on at lodge meetings, and the results must reach union headquarters before the special conference of union executives to consider T.U.C. wage policy on January 12.

Mr. J. B. Figgins, General Secretary of the N.U.R., writes a New Year message in *The Railway Review*:

"The biggest task facing the union industrially in the coming year will be the endeavour to achieve an increase for the lower-paid grades. With devaluation, this becomes ever more urgent, since there must inevitably take place an increase in the cost of living resulting from this fundamental change in the value of sterling."

The Railway Executive has received from the N.U.R. a claim for the standard weekly rate of all adult male employees to be increased to £5 a week minimum excluding London allowance. It is understood that similar applications have been received by the London Transport, Hotels, and Docks Executives. The present minimum rate for railwaymen outside London is 92s. 6d. per week, so that the N.U.R. claim means an increase of 7s. 6d. a week for such staff. Staff working in London get 3s. a week more than those in comparable grades in the provinces.

The previous N.U.R. claim for 10s. a week increase for all its members and for enhanced payment for Saturday afternoon work was rejected by the Board of Conciliation in August, 1949. In September, the N.U.R. special delegate conference accepted the Board's recommendations, but the N.U.R. Executive Committee was at the same time instructed to re-open negotiations with the Railway and the other B.T.C. Executives "with a view to an improvement in wages obtained by low-paid employees." The resolution stated that no employee should receive of less than a £5 standard weekly wage, excluding London allowance.

The R.C.A. and the A.S.L.E.F. have declined to join the N.U.R. in this revised claim. The R.C.A. has agreed to the T.U.C. wage policy, while the A.S.L.E.F. contends that no useful purpose would be served by a fresh claim now, having regard to the findings of the Board of Conciliation.

The employees' side of the Railway Shopmen's National Council lodged a claim with the Railway Executive for a substantial increase, which was declined. This claim is linked with that of the Confederation of Shipbuilding & Engineering Unions for £1 a week increase for all its members, as many railway shopmen are members of the unions affiliated to the Confederation. The General Secretaries of the C.S.E.U. and the N.U.R. are joint secretaries of the R.S.N.C.

The new N.U.R. claim involves the Railway Executive and the other Executives once more in negotiations on a major wage claim on which unilateral action has been taken by the N.U.R. unsupported by either of the other two railway unions.

Any settlement having the effect of reducing the differentials between the lower and higher rated staff and between the unskilled and skilled worker is likely to be resisted by both the A.S.L.E.F. and the C.S.E.U., both of which declined to have anything to do with the offer of the Railway Executive (made during negotiations on the N.U.R. claim for 10s. a week) to increase the rate of pay of the lowest paid worker by 3s. a week with a gradual tapering in the higher ranges.

The N.U.R. contends that the new claim is in line with the T.U.C. policy, as the General Council stated that it recognised that the problem of the standard of living of low-paid workers may call for consideration in certain cases. Nevertheless, the General Council urged that in consideration of even such cases regard should be had to the general economic situation, and to the establishment of incentive schemes.

In a report for presentation to the special conference of executive committees of its affiliated unions on January 12, the T.U.C. General Council states that deflation under duress is the only alternative to wages restraint. "No alternative recommendations," it says, "have emerged from prolonged consideration of the circumstances that exist today. It does not lie wholly within the power of the trade union movement to ensure that the worsened difficulties of the present time can be overcome. But there is no doubt in the minds of the General Council that the trade union movement faces the most searching of all tests of its courage, resolution, and loyalty to fundamental principles. The policy the General Council has formulated is essentially one of helping to maintain by its own efforts, and by self-discipline, the highest possible standards of living of the working people."

In its policy of wage restraint the T.U.C. General Council acted on three guiding principles:—(a) The right of free collective bargaining must be maintained. The Government must not impose wages policy. The existing machinery of voluntary negotiation must be preserved. (b) The T.U.C. itself cannot by its constitution impose a wages policy on affiliated unions. It does, however, give expression to the collective experience of the movement and has the right to expect affiliated unions to conform to policies and recommendations democratically agreed. (c) The General Council makes no suggestion of a standstill on wage earnings. Indeed, it is to be hoped that as productivity increases, earnings will be increased during the current year.

In connection with cost-of-living bonuses and on low wage rates the report states:—

"The recommendations, put forward in the interests of the workpeople of the country as a whole, may well call for very real sacrifice on the part of groups of workers. For unions with sliding scale agreements the position is complicated. No policy of general restraint can be successfully accepted and applied in the general interest if there is a body of workpeople who remain outside the range of its application. In such conditions it is most unlikely that all other unions could voluntarily and sincerely adopt a policy of restraint. Voluntary suspension of existing agreements already fully functioning is an action which may be interpreted as more than restraint on wage demands."

"Nevertheless, with the endeavour of obtaining the greatest practicable measure of stability in the post-devaluation period, the General Council is recommending such unions to reconsider existing arrangements to create conditions in which the movement as a whole can offer its co-operation in a further national effort towards recovery."

Regarding profit restriction, the report refers to the fact that the Chancellor of the Exchequer secured an undertaking from the F.B.I. that it would do what was possible to reduce costs and prices and that its recommendations to industry would be reflected in reduced profits. The report continues:—"It is difficult to reconcile this undertaking and obligation with the record profits being made by so many firms. The General Council is aware of the inevitable limitations of official price control as regards the home market; and as regards exports it is recognised that special considerations prevail, since there is a need for maximising earnings of foreign currencies."

"Nevertheless the General Council is of the opinion that insufficient attention is being given by large sections of industry to the need for avoiding excessive profits and that it is insufficiently accepted that officially accepted controlled prices are maximum prices and not prescribed prices. In existing circumstances it is not enough for industry to rely on the fact that well over half of profits is taken by taxation and used for national purposes. There is a responsibility on industry to see that advantage is not taken of the country's difficulties to secure undue sectional advantage. Generally, the union leaders are not yet satisfied that the requisite degree of equality of sacrifice has been secured."

The C.S.E.U. in support of its claim for a £1 a week increase for all its members contends that such an increase could come out of profits, which would avoid adding to the price of the industry's products.



## San Paulo (Brazilian) Railway Co. Ltd.

The annual general meeting of the San Paulo (Brazilian) Railway Company, whose results were given in our issue of December 30, was held in London on December 20. Lt.-Colonel C. O. H. Bury, Chairman of the company, presiding.

Lt.-Colonel Bury referred to the relinquishment of the chairmanship by Mr. G. M. Booth, and to the services rendered to the company by Mr. Booth during his tenure of office.

During 1948, he said, the Brazilian Government paid them in sterling the amount of their recognised capital as at June 30, 1901, and interest thereon for the period from the handing over of the main line in November, 1946, to the date of payment in September, 1948. The proportion of this interest that applied to 1948 was virtually their sole income for the year, whereas the cost of running the subsidiary undertakings continued. Any increase ultimately admitted by the Brazilian Government in the amount of their recognised capital was to bear interest at 7 per cent, calculated from the date of handing over of the main line. As the amount of such increase had yet to be agreed between the Federal Government and the company, no credit for any interest on such increase could be taken into revenue account during 1948.

Negotiations for the recognition of and payment for their claim could make little progress in 1948, as the Brazilian authorities justifiably deferred close consideration of this until the matter of the recognised capital had been settled by Congress, which was not achieved until three-fourths of the year had gone. At the meeting last June, Mr. Booth, who was then Chairman, was unable to report much progress in their claim, and, apart from constant attendance upon ministries by their representatives in Rio and Sao Paulo, he could report little more; nor could they hope for progress until the Consul General was ready to advise the President as to their case. The Minister of Transport, however, had passed the documents to the Minister of Finance and their lawyers had been able once again to state their case to that minister's legal adviser. They might still have to wait another twelve months.

In June, 1948, they had surrendered the Bragantina Concession to the State of Sao Paulo, and there was criticism by some stockholders that payment should have been exacted for the delivery of such an asset. It was not then appreciated that the Bragantina Section, though it served an important purpose for their main line, was a long-term project that was unlikely to pay its way for very many years. The Bill for acceptance of the Bragantina Railway had passed through the Legal Committee and had been approved by the State Minister of Transport; after examination by a committee, it would be put to the vote of the House. In the belief that the cession of the Bragantina Railway would be accepted at an early date, the directors thought it prudent to make provision now for its eventual elimination from their assets.

During the year under review, they had made repeated efforts to sell their road motor company as a single unit, but did not succeed, because of the crippling liability which a purchaser would have to face in taking over the staff. As the business was running at a loss, they had had to consent to liquidation and to face the heavy personnel indemnity imposed by Brazilian law. Some months ago the

liquidator was able to negotiate with the staff a settlement satisfactory to all parties. As soon as this personnel indemnity was settled, purchasers appeared, and many vehicles had already been sold. Negotiations were in progress for the sale to the Santos-Jundiai Railway of vehicles, repair equipment, and garage buildings.

The basis of a settlement had been reached with the E.F.S.J. (Santos-Jundiai Railway), payment to be made to the company for stores and rolling stock supplied to the E.F.S.J. since expropriation,

partly in cruzeiros and partly in sterling, the cruzeiros to be used for payment to the railway of claim settlements and sundry items.

They were pressing sale of assets of their subsidiary, the Companhia Fazenda Belem, the land-owning company, which were finding a ready market at satisfactory prices.

Regarding pensions for their British employees, shareholders were asked to approve transfer of £300,000 from the general reserve to a special reserve for this purpose.

The report and accounts were adopted.

## British Electric Traction Orders in 1949

*Some important home and overseas orders for electric and diesel-electric rolling stock and substation equipment*

Last year, British makers of electric traction equipment were kept very busy meeting the requirements of railway electrification schemes in this country and abroad, and in this article are given some particulars of progress made by two firms with work already in hand and of new orders obtained in 1949. Much of the equipment referred to has been described in previous issues.

A considerable volume of rectifier business was obtained by the English Electric Co. Ltd., and a large majority of the orders covered equipments for export. The increasing rate of railway electrification provided the major demand for mercury arc rectifiers, and orders received included fourteen 1,200-kW, 1,500-V, d.c. pumpless air-cooled steel tank equipments for the Netherlands Railways and twenty-two 750-kW equipments for the Polish State Railways, which are to be used initially at 800 volts d.c. for electrification of the Danzig-Gdynia line, and, later, at 1,600 volts.

A further order for the Polish State Railways covers a 2,500-kW, 3,300-V, rectifier to increase the capacity of a pre-war substation feeding the Warsaw suburban railway system. The 12,000-kW, of 3,000-V, air-cooled pumpless steel tank equipments to electrify the Estrada de Ferro Santos a Jundiai, Brazil, were delivered during the year. Repeat orders include one from the New South Wales Government Railways for 120-kV, 132-kV, and 138-kV, transformers with ratings from 30 to 55 mVA.

The first eight of the twelve 1,600-h.p. diesel-electric locomotives for the Egyptian State Railways were delivered and the remaining four were shipped at the end of the year. It will be recalled that the English Electric Company supplied the complete power equipments for these locomotives and that the mechanical parts were built in collaboration with the Vulcan Foundry Limited, each company making six sets. The locomotives are employed in working express passenger trains from Cairo to Alexandria and are part of a programme of dieselisation which includes the fifteen 350-h.p. diesel-electric shunting locomotives already supplied.

The first of the fifteen 3,000-h.p. 3,000-V, d.c. main-line electric locomotives ordered for the Estrada de Ferro Santos a Jundiai, formerly the San Paulo Railway, was completed and shipped to Sao Paulo. The locomotives, which were described in detail in our issue of November 4, 1949, are the largest of this type ever built in Britain, and also are being made in collaboration with the Vulcan Foundry Limited, which firm is supplying the mechanical parts. The locomotives form part of a comprehensive contract for sub-

stations, overhead lines, and rolling stock.

The second main-line diesel-electric locomotive, No. 10001, began to run in multiple unit on the L.M.R., British Railways, with No. 10000 on June 1, 1949, and the twin unit of 3,200 h.p. which they formed has been employed in working the "Royal Scot" from Euston to Glasgow, doing the return journey of 800 miles in 24 hours.

An important new order received during 1949 was one from the South Australian Railways for ten power sets, comprising diesel engines and electrical equipment, for 1,600-h.p. main-line diesel-electric locomotives.

A large replacement order was from the Polish State Railways, including equipments and part equipments for 30 three-coach electric trains, nine substations, and spare parts. The Warsaw electrified system was badly damaged during the war, and the English Electric Company, in collaboration with the Metropolitan-Vickers Electrical Co. Ltd., are now replacing original equipment supplied by them in 1935.

Orders also include a total of 41 semi-standard 350-h.p. diesel-electric shunting locomotives for British Railways, the Netherlands State Railways, and the Sudan Railways. A further order came from Tasmania for 600-h.p. diesel-electric equipments, and from the Danish State Railways for 24 motor coach and trailer coach equipments, and a quantity of traction motors.

The target set by the General Electric Co. Ltd. for the export of electrical goods for 1949 was 291 per cent. above 1938. Total shipments by the G.E.C. in 1948-49 represent an advance of 313 per cent. over 1938. Major extensions at Witton Works and at Fraser & Chalmers works, Erith, are being made for the production of capital plant for home and export needs.

The many engine-driven generators for export include sets for the Assam Railway. Orders for rectifiers have been received from many Continental and Commonwealth countries. A 1,200-kW, 1,500-V, mobile equipment for the Netherlands Railways is in commission and a further extensive contract for 16 units of the same rating is in hand. Some 30,000 kW. of rectifier equipment has been put into service on the recently completed Liverpool Street-Shenfield electrification of the Eastern Region of British Railways.

There has been considerable new development in connection with 1,500-V, and 3,000-V, locomotive equipment. The electrical equipment for the 40 main-line locomotives for the South African Railways is now in course of construction. Other

development includes the design of heavy-duty 1,500-V. contactors for locomotives of hourly ratings well above 1,000 h.p.

Progress has been made in the development of a new range of light- and heavy-duty pantographs. The light-duty pantograph will be used on the Estoril Railway, Portugal, and the heavy-duty type on the South African locomotives. A repeat order for 94 motors for surface stock for the London Transport Executive has been received as well as for 54 additional motors for the Northern Line.

A number of 2-bogie, 4-axle type, diesel electric shunting locomotives is on order for the Ceylon Government.

At Liverpool Street Station, terminus of the recently electrified Shenfield suburban services, an all-electric relay interlocking control system has been put into service. The former semaphore signalling has been replaced by colour-light signals with roller-blind type route indicators at many locations. The whole of the equipment in the new signal box, the signals, point motors, a.c. track circuit apparatus, and signalling power supplies were provided and installed by the Siemens & General Electric Railway Signal Company. Re-signalling has been carried out as far as Bethnal Green.

Traffic control equipments have been installed at many offices of British Railways. A simplified form of "train describing" is used at Liverpool Street and Shenfield stations to meet the demands resulting from electrification of the track. An installation on the North-Eastern extension of the L.T.E. provides a maximum of 60 controls with indications at any one of the substations controlled.

## Notes and News

**Agreed Charges.**—Applications for the approval of 96 further agreed charges under the provisions of section 37 of the Road & Rail Traffic Act, 1933, have been lodged with the Transport Tribunal. Notices of objection must be lodged on or before January 17 next.

**Institution of Railway Signal Engineers.**—At a meeting of the Institution of Railway Signal Engineers to be held at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 6 p.m. on January 18, Mr. H. W. Hadaaway will read a paper on "Improvements in Track Circuit Shunts."

**Canadian Rail Wage Claim.**—A Federal Conciliation Board will open hearings early this month into the wages-and-hours dispute between 35,000 Canadian railway workers and the companies. The board was officially appointed to consider union demands for a 10 cent hourly pay increase, a five-day week and union security.

**S. Smith & Son (England) Limited.**—At the annual general meeting on December 21, a final dividend was approved of 10½ per cent. on the preferred ordinary (£27.221) and a dividend of 3½ per cent. on the deferred ordinary shares (£27.221), leaving a balance to be carried forward of £219,930, as against £151,499 last year. In his address the Chairman, Sir Allan Gordon-Smith, said that if nationalisation became general in this country, it would mean the end of Britain as a great industrial nation because it would stultify enterprise and initiative. New Zealand had voted against nationalisation. In Australia the Socialist Government had decided not to proceed with nationalisation; particularly had it no intention of

nationalising steel, and of the two Australian main airlines, one nationalised and the other privately owned, the privately owned line was working at a profit, the nationalised at a loss.

**Madras & Southern Mahratta Railway.**—The liquidator of the Madras & Southern Mahratta Railway (in voluntary liquidation) announces that it is proposed to make a final distribution of assets on January 10. The distribution will amount to 46s. per cent. and with the two previous payments will make a total distribution of £115 6s. per cent.

**Washout on Tanganyika Line.**—The groundnuts area of Central Tanganyika, where a nine-month drought has just ended, is now contending with floods. Heavy rains have washed away parts of the Kongwa Branch, putting it out of action for days. Dodoma Station, where a fortnight ago there was not enough water for locomotives, is flooded.

**J. & F. Stone Lighting & Radio Limited.**—Presiding at the recent annual general meeting, the Chairman, Mr. D. G. Nairn, said that the consolidated trading profit for the year ended June 30 was £377,550, an increase of £49,169 over the preceding year. Profit after taxation was £129,987, which, with unappropriated profits from the previous year, made £172,075. The 40 per cent. ordinary dividend was maintained, and £54,116 carried forward. The record profits were due mainly to increased turnover, an increasing proportion of which had been effected through hire-purchase agreements.

**Canadian National Railways Cut Services.**—The Canadian National Railways have announced a 25 per cent. system-wide reduction in steam-operated passenger trains from January 9, because of "serious depletion of coal reserves of the company." The announcement said the "drastic curtailment" of service resulted from work stoppages and shortened working hours in the U.S. mines on which the company relies for large quantities of fuel. The Vice-President of the Canadian Pacific Railway, Mr. N. R. Crump, said that coal reserves were at present satisfactory and a full service would be maintained. The Canadian National, said to be the largest consumer of coal in Canada, uses between 6,000,000 and 7,000,000 tons a year.

**The Importance of Staff Management and Morale.**—Mr. C. E. R. Sherrington, Secretary, Railway Research Service, took "Transport 1900-1950" as the theme of a paper which he presented to the Metropolitan Section of the Institute of Transport on January 2. The main portion of his talk was a survey of transport conditions in 1900 by rail, road, and water, and he contrasted these conditions with those obtaining today. The principal conclusion emerging from his survey was that the question of staff management and morale transcended all other matters, and coupled with it were the methods of internal administration and organisation. Mr. Sherrington emphasised that interest in the job was of paramount importance, especially where staff were scattered. He said that one might laugh at Victorian England, with its annual salaries to railway ticket collectors and booking clerks of £60, of £65 to signalmen, of £130 to engine drivers, and of £50 to platelayers, but they certainly knew how to handle passenger traffic. Moreover, he said, they had an enthusiasm and a loyalty which were enviable. With the large pay-roll now employed, the retention of a friendly and

encouraging personal touch was essentially difficult. The contrast between 1900 and 1950 lay largely in the system of direction; the committee had replaced the individual executive, and improved communications had done much to reduce local initiative and quick executive action.

**Collision at Cannon Street.**—A number of passengers were hurt when the 8.49 a.m. train from Plumstead collided with the buffers of No. 1 platform at Cannon Street Station, Southern Region, on December 28. Two persons were taken to hospital for treatment, though neither was detained.

**Institution of Locomotive Engineers.**—Mr. W. T. Thompson will read a paper entitled "Roller Bearings—Their Contribution to Modern Rolling Stock Design" before the Institution of Locomotive Engineers, on January 18. The meeting will be held at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 5.30 p.m.

**English Electric Proposed Capital Increase.**—The English Electric Co. Ltd. is considering a programme of financing to include an issue of debenture stock and a small rights offer of ordinary shares to the ordinary stockholders. For this reason, and "in view of expanding business," there will be a meeting of ordinary stockholders on January 16 to consider a resolution to increase the capital to £8,000,000 by the creation of a further £1,500,000 ordinary shares of £1 each.

**Accident at Welwyn Garden City.**—The Eastern Region main line from Kings Cross to the North was blocked on the night of January 2, when shortly after 7.30 p.m. a light engine ran into an empty passenger-train standing outside Welwyn Garden City Station. A number of the passenger coaches were wrecked and both the light engine and the engine of the empty train were derailed. The crews of both engines and the guard of the passenger train were taken to hospital, though only two of the men were detained.

**B.T.C. Acquires Hicks Bros. Ltd.**—In order to extend its interests in road passenger transport in an area where it is already established, the British Transport Commission has reached an agreement to acquire the whole of the share capital of Hicks Bros. Ltd., Braintree, Essex. The newly acquired undertaking has been attached to the Eastern National Omnibus Co. Ltd. and managed by this company on behalf of the B.T.C. as from January 1, 1950. The terms agreed are consistent with the conditions laid down in the Act for compulsory acquisition.

**Scottish Motor Traction.**—Presiding at the annual general meeting on December 29, the Chairman, Sir Andrew Murray, said that while the bus interests were sold as from April 1, 1948, the agreement was not effected until April, 1949, and therefore the profits from April to September, 1948, were brought into last year's accounts. As from the date of the ratification of sale, the car sales department was transferred to a new wholly owned company known as the S.M.T. Sales & Service Co. Ltd., and the position from April, 1949, accordingly had been that the parent body, the Scottish Motor Traction Co. Ltd., was solely a holding company. The company's income from April, 1949, was to be derived from, first, interest on Government stock so long as this continued to be held; second, dividends from the subsidiary companies of Sales & Service

## OFFICIAL NOTICES

None of the vacancies on this page relates to a man between the ages of 18 and 50, inclusive, or a woman between the ages of 18 and 40, inclusive, unless he, or she, is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

**THE FIRST PASSENGER RAILWAY.** By Charles E. Lee. A history of the Swansea & Mumbles Railway, which extends over 136 years. (Cloth, 8½ in. by 5½ in., 91 pp., illustrated, 5s. by post 5s. 3d.) *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

**A PROFESSIONAL Institute for Executives in local Railway and Transport service (Administrative and Technical—Fellows (F.Inst.Ex.O.—F.Inst.Ex.E.) and Associates (A.Inst.Ex.O.—A.Inst.Ex.E.)).** Particulars regarding admission and membership on request from The Secretary, 241, Bristol Road, Birmingham, 5.

**THE RAILWAY SYSTEM OF JAMAICA.** A general description of the system and its traffic, with an account of economic problems; the motive power used; and some features of operation. By H. R. Fox, B.Sc., M.Inst.C.E., General Manager, Jamaica Government Railway. Reprinted from *The Railway Gazette*, January 5 and 12, 1945. Price 1s. Post free 1s. 2d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

**THE EVOLUTION OF RAILWAYS.** Second edition, revised and enlarged. By Charles E. Lee. Traces the germ of railways back to Babylonian times. Cloth, 8½ in. by 5½ in., 72 pp., illustrated, 6s. By post 6s. 4d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

**STATION DESIGN.** A striking example of modern British practice at the important wayside station of Luton. Reprinted from *The Railway Gazette*, July 7, 1944. Price 1s. Post free 1s. 2d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

**INTERNATIONAL RAILWAY ASSOCIATIONS.** Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2s. By post 2s. 2d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

and the Scottish Midland Guarantee Trust; and third, from general investments. The interest on Government stock amounted to £126,453 for the half-year to September 30, 1949. While no dividend was paid by the subsidiary companies, trading profits over twelve months were £157,371, being £65,900 from Sales & Service and £91,471 from the Scottish Midland Guarantee Trust. Dividends from general investments and sundry interests totalled £3,855. The report and accounts were adopted, dividends being declared of 6½ per cent. on the preference, and of 12½ per cent. on the ordinary stock, less income tax.

**Customs Shed Lighting.**—When the Eastern Region of British Railways decided to renovate the Customs sheds at Parkston Main Quay and West Quay it was considered that the installation of fluorescent lighting would do much to brighten the surroundings and assist the officials in their duties. A scheme was prepared and Thorn Electrical Industries Limited was given the contract to supply the fittings. In the main halls 39 Atlas twin-tube decorative fittings were used, together with a quantity of single-tube enclosed units, and in sections where the ceiling level drops considerably Atlas enclosed ceiling units were fitted. A total of 88 units was installed.

**"Weymouth" Engine Naming Ceremony.**—The Southern Region "West Country" class Pacific locomotive No. 34091 was named *Weymouth* by the Mayor of Weymouth on December 29. Mr. S. B. Warder, Mechanical & Electrical Engineer, Southern Region, presided at the ceremony and among others present were the following: Messrs. A. Earle Edwards, Southern Divisional Superintendent, Southern Region; R. G. Pole, Divisional Superintendent, Bristol, Western Region; H. Bolton, District Goods Manager, Bristol, Western Region; W. G. Salmon, Divisional Marine Manager, Weymouth, Southern Region; R. D. Steele, Western Divisional Motive Power Superintendent, Southern Region.

**Keith Blackman Dust Exhauster.**—The firm of Keith Blackman Limited, Tottenham, N.17, has brought out a new dust exhauster and collector unit, applicable to double-ended grinding machines and other operations where dust is created or disturbed. It is completely self-contained; all that is necessary is to connect the electric mains at the terminal box provided and to couple up the air pipe from the machine. A specially designed fan impeller induces air through the unit, and the entrained dust from the machines to which it is applied is extracted before reaching the fan inlet. The fan discharges the air through an outlet at the

top provided with a wireguard and flange to facilitate provision of a duct connection should it be necessary to discharge out side the workshop. In the fan outlet is a sound-absorbing baffle.

**London Midland Region Excursions.**—During 1949 over 4,500,000 passengers were carried by the London Midland Region at day, half-day, and evening excursion fares. Some 7,300 excursion trains were run and many excursion facilities also were provided on ordinary trains.

**Luggage-in-Advance by Air.**—Agreement has been reached with the Customs authorities for passengers travelling from London airport by Air-France to be allowed to send luggage in advance. In the case of an air journey to Paris, instead of a passenger with more than 40 lb. of luggage paying about 9d. per lb. for the excess, he will be able to send the excess in advance at half the freight rate, which will amount to 3½d. per lb.

**Spheroidal Graphite Cast Iron.**—Three British applications, Nos. 630,070, 630,093, and 630,099, in the name of the Mond Nickel Company, have been accepted by the British Patent Office for the production of a new type of cast iron produced by the additions of magnesium, as a result of which the graphite is present in the form of spheroids. It is claimed that this new iron has more than twice the strength of ordinary cast iron and is tougher. It can be bent or twisted—especially after heat treatment.

**C.P.R. Trains in Collision.**—Two main-line transcontinental trains of the Canadian Pacific Railway collided on December 29 at Southesk, about 150 miles south-east of Calgary. One person was killed and 35 injured. The accident occurred when an east-bound train crashed into a west-bound one as it was pulling into a siding. Both trains were moving slowly, but two coaches were overturned. Rescue work was hampered by the weather. The temperature was 20° below zero and recent heavy snow had blocked the roads leading to the scene.

**Dorman, Long & Co. Ltd.**—The Chairman, Sir Ellis Hunter, presiding at the recent ordinary general meeting, alluded to the diamond jubilee of the company, on November 2, and to the early origins of the firm in 1876. Although the past year had been successful, taxation had been excessive, and it was never more necessary than now to conserve profit. The decision of the Government to compromise on the date of operation of the Steel Bill would enable the electorate to express its view. Growing opposition to nationalisation had caused the Government to shift its ground for nationalisation from the alleged

inefficiency of private ownership, proved false by rising production, to the dangers of concentrated power in private hands. The effective supervision for some years past of the Iron & Steel Board was ignored. The refusal of the Government to agree to the segregation of their engineering interests was due to a desire to extend public ownership beyond the steel industry and to acquire a share of the structural engineering industry without any mandate.

**Argentine Train Mishap.**—A train loaded with holiday travellers was derailed on December 30, 35 miles north-west of Buenos Aires en route to Mendoza. Officials said that five persons were killed and 75 injured, 16 seriously. Four coaches were badly damaged. Recent heavy rains are stated to be responsible.

**Timber Development Association Limited.**—Arrangements have been completed by the Timber Development Association Limited, 75, Cannon Street, London, E.C.4, for a series of evening lecture courses to be held in Reading, Swindon, and St. Austell in the early part of 1950. The lectures deal with timber resources, structures, and preservation, as well as modern developments in its uses.

**Railway Steamer in Collision at Southampton.**—After striking the dock-head at Southampton on December 28, the British Railways steamer *Whitstable* proceeded across the dock and struck the oil-tender *Francunion*, which was refuelling British Railways ss. *Brittany*. Severe damage was sustained by the stern of the *Whitstable* and there was some damage to the *Francunion* and *Brittany*.

**East Kent Road Car Co. Ltd.**—The ordinary distribution for the year ended September 30 is maintained at 25 per cent., with a final dividend of 10 per cent. plus a bonus of 10 per cent. Traffic receipts and other revenue were £1,592,960 (£1,586,201 for 1947-48), of which operating and maintenance expenses were £1,038,240 (£957,955). Net profits, after income tax of £85,500 (£120,000) and depreciation of £80,134 (£70,278) were £278,450 (£327,721). The general reserve receives £200,000 (£250,000), while the year's distributions on the preference and ordinary stocks require £69,025, leaving £109,117 to go forward (£99,692).

**Edinburgh to Stirling Services.**—As from February 5 Sunday services will be introduced by the Scottish Region between Edinburgh and Stirling. Trains will leave Edinburgh at 9.50 a.m. and 6.30 p.m. to connect at Stirling with the 10.15 a.m., 10.30 a.m., and 7 p.m. trains from Glasgow to the North. In the reverse direction trains will leave Stirling at 1 p.m. and 8.40 p.m.; the latter train will run in connection with the 3.40 p.m. from Inver-



ness and the 5.25 p.m. from Aberdeen. Commencing Monday, February 6, it is proposed to re-book the 7.46 a.m. train from Larbert to Edinburgh Waverley, to start from Stirling at 7.32 a.m.; this will give Stirling passengers a later departure of 14 min. and avoid a change of trains at Larbert.

### Train in Malaya Wrecked by Terrorists.

—On January 1, terrorists in Malaya wrecked a passenger train between Arau and Padang Besar, just south of the Siam border, and shot and killed the Eurasian driver. The fireman was seriously burned and a mail attendant in the train is missing. Two explosive charges were placed on the line and the track torn up. The front engine, the first coach, and a locomotive at the rear were derailed and burned out. The passengers escaped.

### Forthcoming Meetings

January 6 (Fri.).—Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m. Extra General Meeting: Industrial Administration and Engineering Production Group. "The Lost Wax Process of Precision Casting," by Mr. J. S. Turnbull.

January 6 (Fri.).—Institution of Railway Signal Engineers, at the London Transport Executive Signal School, Earls Court Station, London, S.W.5, at 6.15 p.m. "Signalling Power Supplies," by Mr. D. L. Mitchell.

January 6 (Fri.).—Railway Club, 57, Fetter Lane, London, E.C.4, at 7 p.m. "Railway Developments in South-East London," by Mr. C. F. Wells.

January 6 (Fri.).—Scottish Society of Students of the Locomotive, at the Boardroom, Scottish Regional Headquarters, 302, Buchanan Street, Glasgow, at 7.30 p.m. "The Development of the Diesel Locomotive, with some Scottish Applications," by Mr. Leonard Ingall.

January 7 (Sat.).—British Railways, Southern Region, Lecture & Debating Society, Visit to National Physical Laboratory, Teddington.

January 9 (Mon.).—Institute of Traffic Administration, Birmingham Centre, at the Crown Hotel, Corporation Street, Birmingham, at 6.30 p.m. "Comments on Transport Act, 1947," by Mr. J. Foley-Egginton.

January 10 (Tue.).—Institute of Transport, Metropolitan Section, Guildford & District Group, at the Railway Hotel, Guildford, at 7 p.m. Discussion: "Centralisation v. Decentralisation in Transport," initiated by Mr. H. J. R. Savage.

January 11 (Wed.).—Railway Students' Association, London School of Economics & Political Science, Houghton Street, Aldwych, W.C.2, at 6 p.m. "Education and Training," by Mr. W. P. Allen, Member, Railway Executive.

January 11 (Wed.).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, London Bridge, at 5.45 p.m. Display of S.N.C.F. films.

January 11 (Wed.).—Belfast Association of Engineers. "Railways in the N.W. Europe Campaign," by Colonel R. McCreary and Lt.-Colonel R. L. Charlesworth.

January 12 (Thu.).—Irish Railway Record Society. "The Limerick & Sligo Railways," by Mr. R. W. Clements.

## Railway Stock Market

Despite the lower trend in British Funds, stock markets generally opened the New Year firmly with an improved volume of business. Gold mining and shares of other companies operating overseas attracted more attention, as being outside political uncertainties at home. Industrial shares tended to strengthen in hopes of a change of Government. The next Budget may be an unpleasant shock, but the prevailing assumption is of an election before April.

The latest revenue figures and also the considerable falling off in National Savings adversely affected British Funds though the lower prices in this section were attributed mainly to the small demand, which is not unusual at the beginning of the year. Little selling has been reported at the time of going to press, but Transport and other nationalisation stocks have moved with British Funds. Transport 3 per cent. (1978-88) eased to 89½, the 3 per cent. (1967-72) moved to 92½, and the 3 per cent. (1968-73) to 94½.

Speculation in Japanese, German, and Greek bonds has diverted attention from foreign rails, though the latter remained active. La Guaira Caracas maintained activity around 58, and Bolivar "C" debentures were 43; profit-taking prevented earlier gains from being fully held. It is possible that the take-over talks may take some time, and in any case the purchase money would not be paid out before June.

Leopoldina stocks attracted more attention, with a little speculative buying of both ordinary and preference; the debentures quoted under par are also considered to have scope for capital appreciation. The view is that although payout terms cannot be estimated (because it is uncertain whether it will be decided to make a full payment in respect of preference dividend arrears), a combined purchase of Leopoldina ordinary and preference stock might have speculative possibilities.

Leopoldina ordinary stock has been sold around 8½, the preference around 25½; while the 4 per cent. debentures were firmer at 88½ and the 6½ per cent. debentures 126.

Leopoldina 5 per cent. debentures were 96 and the £1 ordinary units 2s. 6d. Great Western of Brazil has been steady at 130s. San Paulo 10s. ordinary units changed hands more actively around 15s. 6d.

United of Havana attracted more attention, particularly the 1906 debentures, which firmed up to 26. Manila "A" debentures were also firmer at 77 and the 5 per cent. preference shares 7s. Antofagasta ordinary and preference turned easier at 7½ and 46½ respectively. Revived hopes of higher freight rates continued to draw more attention to Canadian Pacific which were sold at up to 28½. Paraguay Central 6 per cent. debentures changed hands at 37.

There was a better trend in road transport and allied companies' shares on the prevailing view of good prospects of dividends being maintained; but in most cases 1949 profits are expected to be below the good levels of 1948. Southdown were 123s. 9d., Lancashire Transport 81s. 6d., and West Riding 68s. B.E.T. in their "ex" bonus form remained active around 48s.

Iron and steel shares generally were maintained on the view that nationalisation may never take place; even if it did, current prices are generally well below official take-over valuations, and exchange into British steel stock would not take place until 1951. Moreover, British Steel stock would have to be issued at a price and on terms in line with the general level of the Gilt-edged market at the time of the exchange. Consequently, even with nationalisation, iron and steel shares would be an interesting option on British Funds. Dorman Long have been sold around 31s. 9d.; United Steel were 27s. 9d., and Stewarts and Lloyds were 53s. 3d.

Shares of locomotive builders and engineers maintained a steady undertone with North British at 19s. 10½d., Bever Peacock 19s. 6d., Vulcan 18s. 7½d., and Gloucester Wagon 51s. 3d.; Wagon Repairs 5s. shares were 17s. Yields in all instances seem to be attractive; and the present market view is that there are good prospects of dividends being maintained.

Traffic Table of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date		
				Total this year	Inc. or dec. compared with 1947-48		Total	Increase or decrease	
							1948-49		
South & Central America	Antofagasta...	811	25.12.49	£ 73,330	—	51	£ 3,468,410	+ 578,240	
	Costa Rica...	281	Sept., 1949	30,929	—	13	102,621	+ 8,998	
	Dorad...	70	Nov., 1949	23,909	—	48	320,787	+ 14,879	
	Inter. Ctl. Amer...	794	Oct., 1949	8579,232	—	43	810,110,125	+ 8960,633	
	La Gualra...	224	Nov., 1949	8108,378	—	48	81,167,360	+ 89,007	
	Nitrato...	382	15.12.49	19,983	—	50	443,971	+ 143,897	
	Paraguay Cent...	274	23.12.49	£ 138,292	—	25	£ 3,600,499	+ 7995,904	
	Peru Corp...	1,050	Nov., 1949	\$6,493,300	+ \$2,623,001	22	\$27,009,758	+ 58,615,128	
	" (Bolivian Section)	66	Nov., 1949	Bs. 11,211,000	+ Bs. 1,920,270	22	Bs. 52,157,164	+ Bs. 8,295,289	
	Salvador...	100	Aug., 1949	c£1,000	—	9	c£173,000	+ c£8,000	
Canada	Taltal...	154	Nov., 1949	15,910	—	22	60,980	+ 22,460	
	United of Havana	1,301	11.6.49	\$231,311	—	49	\$13,733,928	+ 84,659,951	
	Canadian National	23,473	Nov., 1949	14,853,000	—	48	151,818,000	+ 3,068,000	
	Canadian Pacific	17,037	Nov., 1949	10,723,000	—	48	111,045,000	+ 2,988,000	
	Various	Barsi Lights*	167	Nov., 1949	32,257	—	35	388,605	+ 15,450
		Egyptian Delta	607	31.10.49	21,874	—	31	385,264	+ 12,682
		Gold Coast	536	Oct., 1949	217,578	—	497	1,625,728	+ 213,529
		Mid. of W. Australia	277	Oct., 1949	28,391	—	36	109,866	+ 3,847
		Nigeria	1,900	Sept., 1949	485,713	+ 73,445	25	2,703,823	+ 86,332
		South Africa	13,347	10.12.49	1,612,832	+ 139,593	36	54,208,409	+ 5,091,418
Victoria		4,744	Sept., 1949	1,625,367	+ 202,174	13	—	—	

\* Receipts are calculated @ 1s. 6d. to the rupee

† Calculated at 83 to £1